

7.2 Best Practices

7.2.1. Describe two best practices successfully implemented by the Institution as per NAAC format provided in the Manual.

Best Practices-I

1. Title of the Practice

Course file for TLP – The Cardinal Document

2. Goal/ Objectives of the Practice (100 Words)

- To expose the extent and depth of the subject to be covered in a semester.
- To ensure the availability of all the teaching aids required by the teacher.
- To capacitate the teachers to improvise the teaching methodology.
- To make the teacher aware of the prevailing status of the students in advance.
- To encourage students to gain knowledge from various sources related to the subject.
- To facilitate the students in a confident and effective preparation for exams.
- To oversee the parallel achievement of the designated course and programme outcomes.

3. The Context (150 Words)

- Course file is the amalgamation of essential documents to be prepared for every subject by the teachers in accordance to the respective syllabus and duration prescribed by the Anna University.
- In contrast to the primitive teaching methods, this course file enables the teachers to know, find, understand and reproduce the subject content in a radical approach.
- It also enables the teachers to keep in track the coverage of the course and programme outcomes designated for their respective subjects.
- The course file is an integrated practice done by the teachers
 - *before the beginning of the semester*: by preparing the necessary presentations, lesson plans, session plans and question banks;
 - *during the semester*: by keeping a record of the performance in internal examinations, question paper and answer paper audits, counselling
 - *after completion of the semester exams*: by collecting student feedbacks, CO-PO attainment sheets and providing the faculty feedback with the pros and cons faced in the tenure for effective upgradation in the upcoming semesters.

4. The Practice (400 Words)

- Course Information sheet: The primary document prepared by a teacher for handling the respective subject effectively as it illustrates the department, core and the importance of every topic being covered in the syllabus of the respective subject. The teacher also coin the various opportunities available for the respective subject in the industry.
- Academic Calendar: Prepared by Academic head in accordance to the schedule given by the Anna university and the all the college events.
- Time Table: Prepared by every department considering the total number of theoretical and practical subjects to be covered.
- ABC Analysis: Based on the academic performance of the students in the previous semesters, they are classified in A, B and C groups and coaching is provided accordingly. The elite students are involved in the next level of academic activities whereas the slow learners are focused towards better preparation for the exams.

- CPP: Course Pedagogy Presentation involves breakdown of the subject's syllabus and the method of the teaching approach proposed by the teacher. They also quest the job opportunities available in the stream of their respective subject
- Lesson Plan: The day-to-day scheduling of covering the subject's syllabus within its prescribed time aids the teachers to be prepared with the methodologies proposed. It also illustrates the reference material available across all media for the respective subject.
- Session plan: A micro-level planning for every minute of a particular session starting with a recap of the previous topics, explanation of the scheduled topic and giving the students to read about the topic to be covered on the next class.
- Question Bank: The collection of all the relevant questions in every unit and their respective answers are prepared by the teachers before the commencement of the semester. This ensures the students to present their answers in a better way.
- Answer Keys: The answer keys for the previous 5 semester Anna university question papers are prepared by the teachers for all the subjects before the semester begins to give a clear understanding on the mark allocation for various questions.
- Audits: The question papers and the answers sheets of the internal assessments are audited by IQAC to ensure proper question weightage and facilitate the students to be prudent in their preparation.
- CO-PO Attainment: Based on the student's performance in internals, their marks are categorized for each CO and the revision classes are planned accordingly. The slow learners are identified and individual coaching sessions are planned for all the subjects.
- Student Feedback: Along the course of the semester, feedbacks are collected from the students via class committee meeting (CCM) at the end of every month to evaluate the quality of teaching in that respective semester and solve the requirements and comments of the students immediately during the progress of the semester.
- Course end survey: Upon the completion of the course, each student is requested to fill a survey form to evaluate the gross input given the student throughout the course period and to incorporate the required corrective measures in the then-coming semesters.
- Faculty Feedback: The faculties also provide feedback insisting the pros and cons of the methodologies handled and the summary on the output received which helps in a consistent upgradation in the upcoming semesters.

5. Evidence of Success (200 Words)

- The teachers approach the lecture session with a well scheduled plan and methodologies which helps them in finishing the chapters on time and plan for coaching classes and other related co-curricular activities like site visits, symposiums, conferences etc.
- The students derive a definitive study chart and show consistent improvement in the examinations across the semester and produced commendable results in the end semester exam.
- The course file also benefit in better placement as this radical approach strengthens the basics of every subject and it also finds time to provide exclusive placement coaching sessions consequencing in consistent placement records.
- The micro lesson planning with details of reference materials across various media broadens the vision of a student towards engineering and provoke them to utilize them and turn up with a product development, R&D, post graduate studies etc.
- The CPP illustrates the various job opportunities related to every subject and fixates a reliable carrier path for the students during the course tenure.
- Even upon the unanticipated epidemic curfew, we were able to stabilize the teaching process with slight modifications towards online coaching as we had a meticulous course plan in advance.

6. Problems Encountered and Resources Required (150 Words)

- The course file is a conditional set of documents that requires to be updated every semester as the student batch, syllabus is updated and so it's a time consuming

process to update according to the prevailing conditions To counter this, faculty development. programs (FDP) are organized for all the teachers to be aware of the upcoming upgrades and prepare accordingly in advance.

- The session plan is a micro level planning work which requires the teachers to forecast the state of students and the classrooms well in advance and plan for every minute. This requires the management to arrange for orientation sessions to help the teachers in smart planning and to make them aware of the fore coming changes to be adopted.
- Adoption towards the online teaching methods required decisive modifications across the course file and this required the management to provide the teachers with proper internet support and online teaching tools and LMS tools for effective communication.

CARE

COLLEGE OF ENGINEERING

(Approved by AICTE and Affiliated to Anna University, Chennai)
27, Thayanur, Trichy - 620009

DEPARTMENT: ELECTRONICS & COMMUNICATION ENGINEERING


COURSE FILE INDEX

S.No.	Description	Yes/No
1	Student Nominal Roll	Yes
2	ABC Analysis	Yes
3	Course Information Sheet	Yes
4	Timetable (Class)	Yes
5	Timetable (Faculty)	Yes
6	Academic Calendar	Yes
7	Lesson plan (Macro)	Yes
8	Session Plan (Micro)	Yes
9	Sample PPT Handouts	Yes
10	List of ICT Tools used (Software/Virtual Labs/Guest Lecture/ Student Seminars/Case Study/ Video Links)	Yes
11	Previous 3 Years (6 Sem) University QPs with mapping	NA
12	Question Bank (2 Marks & Essay for all Units)	Yes
13	2 Marks Question and Answers (All Units)	Yes
14	Assignment Questions & Samples	Yes
15	Internal Test Question Paper(5 Nos.)	Yes
16	Answer Key(5 Nos.)	Yes
17	Internal test mark analysis sheets (5 Nos.)	Yes
18	Samples(Good, Average & poor) for all three tests	Yes
19	Assessment of Consolidated Internal Marks (100 marks)	Yes
20	Root cause analysis & Remedial action taken(Remedial Test Mark, Attendance, Samples)	Yes
21	Course End Feedback / Survey	Yes
22	Course End Feedback / Survey - Action taken report	Yes
23	University Question Paper Analysis	Yes
24	CO & PO - Attainment sheet	Yes
25	Feedback by Faculty	Yes
26	Attendance & Assessment Book	Yes


Prepared
(Faculty in-charge)


Checked by
(HOD)


Verified by 16/12/22
(IQAC Coordinator)


Approved by 7.6.23
(Principal)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
ACADEMIC YEAR:2022-2023(EVEN)

STUDENT NOMINAL ROLL

Year / Sem : II/IV

Batch : 2021-25

S.No	Roll No	Reg. No	Name
1	B21EC001	810721106001	ARASU C
2	B21EC002	810721106002	AROCKIYA JAYARAJ S
3	B21EC025	810721106003	CHARUKESI S
4	B21EC003	810721106004	DHARUNIKA M
5	B21EC004	810721106005	DIVYADHARSHINI G
6	B21EC005	810721106006	ESWARAMOORTHY M
7	B21EC006	810721106007	HANISH K A
8	B21EC007	810721106008	HELEN PRICILLA X
9	B21EC008	810721106009	KAYAL VIZHI R
10	B21EC009	810721106010	KOWSIKA S
11	B21EC010	810721106011	MEGANATH V
12	B21EC011	810721106012	NOVA AROCKIA RAJ V
13	B21EC012	810721106013	REEGAN RUSOUL L
14	B21EC013	810721106014	RIYAZ KHAN S
15	B21EC014	810721106015	SAKTHIVEL N
16	B21EC015	810721106016	SAMRUTH SRIRAM D
17	B21EC016	810721106017	SANTHOSH K
18	B21EC017	810721106018	SIVAGANAPATHY R
19	B21EC018	810721106019	SUBHIKSHA S
20	B21EC019	810721106020	SUDHARSAN R
21	B21EC020	810721106021	SUJITHA R
22	B21EC021	810721106022	SURIYAPRABU P
23	B21EC023	810721106024	THARUNIKA M E
24	B21EC024	810721106025	UMAMAGESHWARI K


 Faculty


HOD
HEAD
 Dept. of Electronics and Communication Engg.
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
ACADEMIC YEAR:2022-2023(EVEN)


ABC Analysis

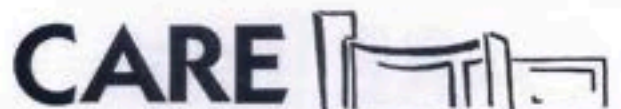
Year / Sem : II/IV

Batch : 2021-25

S.No	Category	Roll No	Reg. No	Name
1	A	B21EC003	810721106004	DHARUNIKA M
2		B21EC004	810721106005	DIVYADHARSHINI G
3		B21EC007	810721106008	HELEN PRICILLA X
4		B21EC008	810721106009	KAYAL VIZHI R
5		B21EC010	810721106011	MEGANATH V
6		B21EC011	810721106012	NOVA AROCKIA RAJ V
7		B21EC012	810721106013	REEGAN RUSOUL L
8		B21EC015	810721106016	SAMRUTH SRIRAM D
9		B21EC024	810721106025	UMAMAGESHWARI K
10	B	B21EC001	810721106001	ARASU C
11		B21EC002	810721106002	AROCKIYA JAYARAJ S
12		B21EC014	810721106015	SAKTHIVEL N
13		B21EC016	810721106017	SANTHOSH K
14		B21EC019	810721106020	SUDHARSAN R
15	C	B21EC025	810721106003	CHARUKESI S
16		B21EC005	810721106006	ESWARAMOORTHIM
17		B21EC006	810721106007	HANISH K A
18		B21EC009	810721106010	KOWSIKA S
19		B21EC013	810721106014	RIYAZ KHAN S
20		B21EC017	810721106018	SIVAGANAPATHY R
21		B21EC018	810721106019	SUBHIKSHA S
22		B21EC020	810721106021	SUJITHA R
23		B21EC021	810721106022	SURIYAPRABU P
24		B21EC023	810721106024	THARUNIKA M E


 Class Coordinator


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COLLEGE OF ENGINEERING

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COURSE INFORMATION SHEET

PROGRAMME: Electronics and Communication Engineering	DEGREE: B.E.
COURSE: Network Security	SEMESTER: IV CREDITS: 04
COURSE CODE: EC3401 REGULATION: R 2021	COURSE TYPE: CORE
COURSE AREA/DOMAIN: Communication Networks	CONTACT HOURS: 6 hours/Week.
CORRESPONDING LAB COURSE CODE (IF ANY): EC3401	LAB COURSE NAME: Network Security Integrated Laboratory

SYLLABUS:

UNIT	DETAILS	HOURS
I	NETWORK MODELS AND DATALINK LAYER- Overview of Networks and its Attributes – Network Models – OSI, TCP/IP, Addressing – Introduction to Datalink Layer – Error Detection and Correction – Ethernet(802.3)- Wireless LAN – IEEE 802.11, Bluetooth – Flow and Error Control Protocols – HDLC – PPP.	9
II	NETWORK LAYER PROTOCOLS- Network Layer – IPv4 Addressing – Network Layer Protocols(IP,ICMP and Mobile IP) Unicast and Multicast Routing – Intradomain and Interdomain Routing Protocols – IPv6 Addresses – IPv6 – Datagram Format - Transition from IPv4 to IPv6.	9
III	TRANSPORT AND APPLICATION LAYERS- Transport Layer Protocols – UDP and TCP Connection and State Transition Diagram - Congestion Control and Avoidance(DEC bit, RED)- QoS - Application Layer Paradigms – Client – Server Programming – Domain Name System – World Wide Web, HTTP, Electronic Mail.	9
IV	NETWORK SECURITY- OSI Security Architecture – Attacks – Security Services and Mechanisms – Encryption –Advanced Encryption Standard – Public Key Cryptosystems – RSA Algorithm – Hash Functions – Secure Hash Algorithm – Digital Signature Algorithm.	9
V	HARDWARE SECURITY- Introduction to hardware security, Hardware Trojans, Side – Channel Attacks – Physical Attacks and Countermeasures – Design for Security. Introduction to Blockchain Technology.	9
TOTAL HOURS		45

TEXT/REFERENCE BOOKS:

T/R	BOOK TITLE/AUTHORS/PUBLICATION
T	Behrouz.A.Forouzan, Data Communication and Networking, Fifth Edition, TMH, 2017.(Unit – I,II,III)
T	William Stallings, Cryptography and Network Security, Seventh Edition, Pearson Education, 2017(Unit- IV)
T	BhuniaSwarup, Hardware Security –A Hands On Approach,Morgan Kaufmann, First edition, 2018.(Unit – V).
R	James.F.Kurose and Keith.W.Ross, Computer Networking – A Top – Down Approach, Sixth Edition, Pearson, 2017.
R	Doughlas .E.Comer, Computer Networks and Internets with Internet Applications, Fourth Edition, Pearson Education, 2008.

COURSE PRE-REQUISITES:

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C.CODE	COURSE NAME	DESCRIPTION	SEM
EC3352	Digital Systems Design	To understand the basics of digital signals	03
EC3354	Signals and Systems	To get the concepts of the different types of signals	03
CS3353	C Programming and Data Structures	To learn the basic of C Programming	03

COURSE OBJECTIVES:

1	To learn the Network Models and datalink layer functions.
2	To understand routing in the Network Layer.
3	To explore methods of communication and congestion control by the Transport Layer.
4	To study the Network Security Mechanisms.
5	To learn various hardware security attacks and their countermeasures.

COURSE OUTCOMES:

S.NO.	DESCRIPTION	PO MAPPING
1	Explain the Network Models, layers and functions.	a,b,c,d,e,f,k,l
2	Categorize and classify the routing protocols.	a,b,c,d,e,f,k,l
3	List the functions of the transport and application layer.	a,b,c,d,e,f,k,l
4	Evaluate and choose the network security mechanisms.	a,b,c,d,e,f,k,l
5	Discuss the hardware security attacks and countermeasures.	a,b,c,d,e,f,k,l

GAPES IN THE SYLLABUS - TO MEET INDUSTRY/PROFESSION REQUIREMENTS:

S.NO.	DESCRIPTION	PROPOSED ACTIONS
1	Network simulations for the described systems and detailed analysis	Lab
2	Routing Algorithms	Assignment

PROPOSED ACTIONS: TOPICS BEYOND SYLLABUS/ASSIGNMENT/INDUSTRY VISIT/GUEST LECTURER/NPTEL ETC

TOPICS BEYOND SYLLABUS/ADVANCED TOPICS/DESIGN:

1	Congestion control and Avoidance algorithms – NPTEL Videos
2	Network simulations – Guest lecture
3	Types of Networking and network simulations – Industrial Visit

WEB SOURCE REFERENCES:

1	https://nptel.ac.in/courses/106/105/106105183/
2	https://courses.iitm.ac.in/course/info.php?id=2218
3	https://www.alljnturworld.in/download/computer-networks-cn-materials-notes/
4	https://www.youtube.com/watch?v=UXMlxCYZu8o
5	https://freevideolectures.com/course/2276/computer-networks
6	https://www.imedita.com/blog/top-10-list-of-network-simulation-tools/
7	https://www.javatpoint.com/computer-network-routing-algorithm

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8	https://www.tutorialspoint.com/what-is-a-routing-algorithm-in-computer-network
9	https://www.forcepoint.com/cyber-edu/network-security

DELIVERY/INSTRUCTIONAL METHODOLOGIES:


<input checked="" type="checkbox"/> CHALK & TALK	<input checked="" type="checkbox"/> STUD. ASSIGNMENT	<input checked="" type="checkbox"/> WEB RESOURCES	PPT
<input checked="" type="checkbox"/> LCD	<input checked="" type="checkbox"/> STUD. SEMINARS	<input type="checkbox"/> ADD-ON COURSES	

ASSESSMENT METHODOLOGIES-DIRECT

<input checked="" type="checkbox"/> ASSIGNMENTS	<input checked="" type="checkbox"/> STUD. SEMINARS	<input checked="" type="checkbox"/> TESTS/MODEL EXAMS	<input checked="" type="checkbox"/> UNIV. EXAMINATION
<input type="checkbox"/> STUD. LAB PRACTICES	<input checked="" type="checkbox"/> STUD. VIVA	<input checked="" type="checkbox"/> MINI/MAJOR PROJECTS	<input type="checkbox"/> CERTIFICATIONS
<input type="checkbox"/> ADD-ON COURSES	<input type="checkbox"/> OTHERS		

ASSESSMENT METHODOLOGIES-INDIRECT

<input checked="" type="checkbox"/> ASSESSMENT OF COURSE OUTCOMES (BY FEEDBACK, ONCE)	<input checked="" type="checkbox"/> STUDENT FEEDBACK ON FACULTY (TWICE)
<input checked="" type="checkbox"/> ASSESSMENT OF MINI/MAJOR PROJECTS BY EXT. EXPERTS	


Prepared by
Faculty In-charge
R.DEEPALAKSHMI, AP/ECE


Approved by
(HOD)
Dr. J. JAYARANI
HEAD
Dept. of Electronics and Communication Engg.
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING ACADEMIC YEAR 2022-2023 EVEN SEMESTER

TIMETABLE- SECOND YEAR

YEAR: II

SEMESTER: IV

DAY	1 09.00 am	2 09.50 am	3 10.40 am	4 11.45 am	5 12.35 pm	6 01.30 pm	7 03.10 pm	8 04.10 pm
MON	09.50 am EC3492 - DSP	10.40 am EC3491 - CS	10.55 am EC3401 - Networks and Security Integrated lab	11.45 am EC3452 - EMF (Tutorial)	12.35 pm LUNCH	01.30 pm EC3451 - LIC	03.10 pm BREAK	04.10 pm EC3461 - CS lab
TUE	EC3401- NS	EC3451 - LIC	EC3452 - EMF (Tutorial)	Library / Counselling	EC3451 - EVS	EC3491 - CS lab	EC3492 - DSP Integrated lab	
WED	EC3491 - CS	EC3452 - EMF	EC3492 - DSP	EC3451 - LIC	EC3451 - EVS	EC3451 - LIC	EC3401- NS	EC3452 - EMF
THU	EC3451 - LIC	EC3492 - DSP	EC3401- NS	EC3452 - EMF	EC3491 - CS	EC3462 - LIC lab	EC3462 - LIC lab	
FRI	EC3452 - EMF	EC3491 - CS	Training & Placement		EC3451 - EVS	EC3401-NS	EC3451 - LIC	EC3492 - DSP

SL. NO.	CODE	SUBJECT NAME	NAME OF THE STAFF	CREDITS	TOTAL HOURS
1	EC3452	Electromagnetic Fields	Ms.S.Dhivya	3	6
2	EC3401	Networks and Security	Ms.R.Deepalakshmi	4	6
3	EC3451	Linear Integrated Circuits	Ms.R.Vanitha	3	5
4	EC3492	Digital Signal Processing	Ms.J.S.Jenin	4	6
5	EC3491	Communication Systems	Ms.M.Shivashankari	3	5
6	GE3451	Environmental Sciences and Sustainability	Mrs.G.Banu Karthi, AP/Chemistry	2	3
7	EC3461	Communication Systems Laboratory	Ms.M.Shivashankari	1.5	3
8	EC3462	Linear Integrated Circuits Laboratory	Ms.R.Vanitha	1.5	3
9		Library / Counselling / Sports	Ms.R.Vanitha / Mentors	1	1
10		Training and Placement		2	2
Total Hours:				40	

J. Jeyaraj

HEAD

Signature of HoD/ECE/EC Engg.
Dept of Electronics and Communication Engg.

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
ACADEMIC YEAR 2022-2023 EVEN SEMESTER

INDIVIDUAL TIMETABLE

DAY	1 09.00 am - 09.50 am	2 09.50 am - 10.40 am	3 10.55 am 11.45 am	4 11.45 am 12.35 pm	5 01.30 pm 02.20 pm	6 02.20 pm 03.10 pm	7 03.20 pm 04.10 pm	8 04.10 pm 05.00 pm
MON								
TUE	EC3401-N S		EC3401 - Networks and Security					
WED		EC8691 - MP & MC		EC8691 - MP & MC			EC3401-N S	
THU					EC8691 - MP & MC			
FRI	EC8691 - MP & MC					EC3401- NS		
				LUNCH			BREAK	

SL. NO.	CODE	SUBJECT NAME	NAME OF THE STAFF	CREDITS	TOTAL HOURS
1	EC8691	Microprocessors and Microcontrollers	Ms.R.Deepalakshmi	3	4
2	EC3401	Networks and Security	Ms.R.Deepalakshmi	4	6
				Total Hours:	10

J. Jeyan

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Dept. of Electronics and Communication Engg.
 CARE College of Engineering
 Anna University, Chennai

CARE COLLEGE OF ENGINEERING
AY 2022-23 : IV,VI & VIII Semester Academic Calendar

Date	Day	Feb-23 Events	WD	Date	Day	Mar-23 Events	WD	Date	Day	Apr-23 Events	WD	Date	Day	May-23 Events	WD	Date	Day	Jun-23 Events	WD
1	Wed	IV,VI&VIII SEM OPEN / Course File Audit	1	1	Wed		24	1	Sat	CT 2 QP Audit / Symposium - CSE,AD	50	1	Mon	May Day	#	1	Thu		
2	Thu		2	2	Thu	CT 1 QP Audit	25	2	Sun	Holiday	#	2	Tue	Model Theory	71	2	Fri		
3	Fri		3	3	Fri	Unit 2 Completion	26	3	Mon		51	3	Wed	Model Theory	72	3	Sat		
4	Sat	Holiday	#	4	Sat	Sports Day	27	4	Tue	Unit 4 Completion	52	4	Thu	Model Theory	73	4	Sun	Holiday	#
5	Sun	Holiday	#	5	Sun	Holiday	#	5	Wed	CT - 2	53	5	Fri	Model Theory	74	5	Mon		
6	Mon		4	6	Mon	CT - 1	28	6	Thu	CT - 2	54	6	Sat	Model Theory	75	6	Tue		
7	Tue		5	7	Tue	CT - 1	29	7	Fri	Good Friday	#	7	Sun	Holiday	#	7	Wed		
8	Wed		6	8	Wed	CT - 1	30	8	Sat	Holiday	#	8	Mon	Model Theory	76	8	Thu		
9	Thu		7	9	Thu	CT - 1	31	9	Sun	Holiday	#	9	Tue	Model Practical	77	9	Fri		
10	Fri		8	10	Fri	CT - 1	32	10	Mon	CT - 2	55	10	Wed	Model Practical	78	10	Sat		
11	Sat		9	11	Sat	CT - 1	33	11	Tue	CT - 2	56	11	Thu	Model Practical / MT Answer Sheet Audit	79	11	Sun	Holiday	#
12	Sun	Holiday	#	12	Sun	Holiday	#	12	Wed	CT - 2	57	12	Fri	Model Practical, LWD	80	12	Mon		
13	Mon		10	13	Mon		34	13	Thu	CT - 2	58	13	Sat	Holiday	#	13	Tue		
14	Tue		11	14	Tue		35	14	Fri	Tamil New Year	#	14	Sun	Holiday	#	14	Wed		
15	Wed		12	15	Wed	CT 1 Answer Sheet Audit	36	15	Sat	Holiday	#	15	Mon	University Practical Starts	#	15	Thu		
16	Thu		13	16	Thu		37	16	Sun	Holiday	#	16	Tue		#	16	Fri		
17	Fri		14	17	Fri		38	17	Mon		59	17	Wed		#	17	Sat		
18	Sat	Unit 1 Completion	15	18	Sat	Unit 3 Completion	39	18	Tue		60	18	Thu		#	18	Sun	Holiday	#
19	Sun	Holiday	#	19	Sun	Holiday	#	19	Wed	CT 2 Answer Sheet Audit / CCM 3 / CSE, AD	61	19	Fri		#	19	Mon		
20	Mon	CCM 1 (CSE,AD)	16	20	Mon	CCM 2 (CSE,AD)	40	20	Thu	CCM 3	62	20	Sat	Holiday	#	20	Tue		
21	Tue	CCM 1 (CIVIL,ECE,MECH)	17	21	Tue	CCM 2 (CIVIL,ECE,MECH)	41	21	Fri		63	21	Sun		#	21	Wed		
22	Wed		18	22	Wed	Telugu New Year	#	22	Sat	Annual Day	64	22	Mon		#	22	Thu		
23	Thu		19	23	Thu	Symposium - ECE	42	23	Sun	Holiday	#	23	Tue		#	23	Fri		
24	Fri		20	24	Fri		43	24	Mon		65	24	Wed		#	24	Sat		
25	Sat		21	25	Sat	Symposium - MECH	44	25	Tue	Unit 5 Completion	66	25	Thu		#	25	Sun	Holiday	#
26	Sun	Holiday	#	26	Sun	Holiday	#	26	Wed	Revision	67	26	Fri	University Theory Starts	#	26	Mon		
27	Mon		22	27	Mon	Symposium - CIVIL	45	27	Thu	Revision / MT QP Audit	68	27	Sat	Holiday	#	27	Tue		
28	Tue		23	28	Tue		46	28	Fri	Revision	69	28	Sun	Holiday	#	28	Wed		
29	Wed		24	29	Wed		47	29	Sat	Revision	70	29	Mon		#	29	Thu		
30	Thu		30	30	Thu		48	30	Sun	Holiday	#	30	Tue		#	30	Fri		
31	Fri		31	31	Fri		49	31	Wed		21	31	Wed		#	31	Thu		
		Working Days	23			Working Days	26			Working Days	21			Working Days	10			Working Days	0
Total Working Days : 80 Commencement of Univ. Theory Exam 26.05.2023																			

S. Suban

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27, Thayanur, Trichy - 620009

DEPARTMENT: ECE

Lesson plan (Micro level)

Faculty Name: R.Deepalakshmi
Course Code & Name: EC3401- Network Security
Academic Year: 2022-2023

Designation: Assistant Professor

Sem/Year: IV/II

UNIT I - NETWORK MODELS AND DATALINK LAYER							
S.N o.	Topics	Planned Date	Mode of Teaching	Reference	Course outcome	Actual date	Remark
1	Overview of Networks and its Attributes	07.02.23	BOARD	T1	CO1	13.02.23	
2	Network Models	08.02.23	BOARD	T1	CO1	14.02.23	
3	OSI Model	09.02.23	PPT	T1	CO1	15.02.23	
4	TCP/IP Addressing	10.02.23	BOARD	T1	CO1	16.02.23	
5	Introduction to Datalink Layer	11.02.23	BOARD	T1	CO1	17.02.23	
6	Error Detection and Correction	14.02.23	BOARD	T1	CO2	18.02.23	
7	Ethernet(802.3)	15.02.23	PPT	T1	CO2	21.02.23	
8	Wireless LAN – IEEE 802.11, Bluetooth	16.02.23	PPT	T1	CO1	22.02.23	
9	Flow and Error Control Protocols – HDLC – PPP	17.02.23	BOARD	T1	CO1	22.02.23	
Total No. of Hours prescribed per Unit by Anna University					9		
Total No. of Hours Required as per Lesson Plan					9		
Signature of Faculty				Signature of HOD			
UNIT II NETWORK LAYER PROTOCOLS							
10	Network Layer	18.02.23	BOARD	T1	CO2	23.02.23	
11	IPv4 Addressing	21.02.23	BOARD	T1	CO2	23.02.23	
12	Network Layer Protocols(IP,ICMP and Mobile IP)	22.02.23	PPT	T1	CO2	24.02.23	
13	Unicast and Multicast Routing	23.02.23	BOARD	T1	CO2	25.02.23	
14	Intradomain and Interdomain Routing Protocols	24.02.23	BOARD	T1	CO2	28.02.23	
15	IPv6 Addresses	25.02.23	PPT	T1	CO2	01.03.23	
16	IPv6	27.02.23	PPT	T1	CO2	01.03.23	
17	Datagram Format	28.02.23	BOARD	T1	CO2	02.03.23	
18	Transition from IPv4 to IPv6.	01.03.23	PPT	T1	CO2	03.03.23	
Total No. of Hours prescribed per Unit by Anna University					9		
Total No. of Hours Required as per Lesson Plan					9		
Signature of Faculty				Signature of HOD			
UNIT III TRANSPORT AND APPLICATION LAYERS							
19	Transport Layer Protocols	02.03.23	PPT	T1	CO3	07.03.23	
20	UDP and TCP Connection and	03.03.23	PPT	T1	CO3	07.03.23	

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(Approved by AICTE and Affiliated to Anna University, Chennai)
27, Thayanur, Trichy - 620009

DEPARTMENT: ECE

	State Transition Diagram	08.03.23				
21	Congestion Control and Avoidance(DEC bit, RED)	07.3.23	BOARD	T1	CO3	14.3.23
22	QoS	09.03.23	BOARD	T1	CO3	15.03.23
23	Application Layer Paradigms	14.03.23	BOARD	T1	CO3	16.03.23
24	Client – Server Programmin	15.03.23	BOARD	T1	CO3	27.03.23
25	Domain Name System	16.03.23	PPT	T1	CO3	21.03.23
26	World Wide Web	19.03.23	PPT	T1	CO3	28.03.23
27	HTTP, Electronic Mail.	11.03.23	PPT	T1	CO3	28.03.23
Total No. of Hours prescribed per Unit by Anna University					9	
Total No. of Hours Required as per Lesson Plan					9	
Signature of Faculty			Signature of HOD <i>J. Jeyaraj</i>			

UNIT IV NETWORK SECURITY

28	OSI Security Architecture	18.03.23	BOARD	T2	CO4	29.03.23
29	Attacks – Security Services and Mechanisms	21.03.23	PPT	T2	CO4	30.03.23
30	Encryption	22.03.23	BOARD	T2	CO4	30.03.23
31	Advanced Encryption Standard	23.03.23	PPT	T2	CO4	01.04.23
32	Public Key Cryptosystems	24.03.23	PPT	T2	CO4	01.04.23
33	RSA Algorithm	25.03.23	PPT	T2	CO4	01.04.23
34	Hash Functions	28.03.23	PPT	T2	CO4	04.04.23
35	Secure Hash Algorithm	29.03.23	PPT	T2	CO4	04.04.23
36	Digital Signature Algorithm	30.03.23	BOARD	T2	CO4	04.04.23
Total No. of Hours prescribed per Unit by Anna University					9	
Total No. of Hours Required as per Lesson Plan					9	
Signature of Faculty			Signature of HOD <i>J. Jeyaraj</i>			

UNIT V HARDWARE SECURITY

37	Introduction to hardware security	31.03.23	PPT	T3	CO5	10.04.23
38	Hardware Trojans	01.04.23	PPT	T3	CO5	18.04.23
39	Side – Channel Attacks	04.04.23	PPT	T3	CO5	19.04.23
40	Physical Attacks	18.04.23	BOARD	T3	CO5	20.04.23
41	Countermeasures	19.04.23	BOARD	T3	CO5	20.04.23
42	Seminar	20.04.23	PPT	T3	CO5	25.04.23
43	Design for Security	21.04.23	PPT	T3	CO5	25.04.23
44	Introduction to Blockchain Technology	22.04.23	PPT	T3	CO5	25.04.23
45	Applications	25.04.23	PPT	T3	CO5	25.04.23

Total No. of Hours prescribed per Unit by Anna University					9	
Total No. of Hours Required as per Lesson Plan					9	
Signature of Faculty			Signature of HOD <i>J. Jeyaraj</i>			

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DEPARTMENT: ECE

Total No. of Hours prescribed by Anna University for Completion of the Course		45
Total No. of Hours Required as per Lesson Plan to complete the Course		45
No. of Hours Required for covering Content Beyond Syllabus		2
Total No. of Lecture Hours for Completion of the Course		47
Prepared by	Name: R Deepalakshmi Designation: Assistant Professor	Sign 
Approved by	Name: Dr.J.Jeyarani Designation: HOD/ECE	Sign 

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Session Plan

Faculty Name: R.Deepalakshmi
Course Code & Name: EC3401- Networks and Security
Semester: Odd / Even
Topics Discussed :Overview of Data Communications, Networks

Designation & Department: AP/ECE
Academic Year: 2022-2023
Class:II Unit: 1
Date of Lecture: 07.02.2023

	Description	Mode of Teaching	Time in Mins	Remarks
1	Recap of Previous Topics/Classes handled Communication & data communication	PPT	5	
2	Brief Explanation of Topics to be handled today Overview of Communication	PPT	2	
3	Explain the concept with analogy Types of communication	PPT	3	
4	Pre-requisites of the topic Basics of networks	PPT	5	
5	Explanation about the topics/concepts step by step Discuss about various types of networks	PPT	10	
6	Explain with examples Medium of communication	Videos	7	Youtube Source
7	Plan for Q&A session / Activities Types of networks	Discussion	3	
8	Summarization Types of networks	PPT	3	
9	Give the topics to be read by students for next class Building Network and its types	PPT	2	

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Session Plan

Faculty Name: R.Deepalakshmi
Course Code & Name: EC3401- Networks and Security
Semester: Odd / Even
Topics Discussed :Building Network and its types

Designation & Department: AP/ECE
Academic Year: 2022-2023
Class:II Unit: 1
Date of Lecture: 08.02.2023

	Description	Mode of Teaching	Time in Mins	Remarks
1	Recap of Previous Topics/Classes handled Overview of data communication	PPT	5	
2	Brief Explanation of Topics to be handled today Building Network and its types	PPT	2	
3	Explain the concept with analogy Types of networks	PPT	3	
4	Pre-requisites of the topic Basic Networks	PPT	5	
5	Explanation about the topics/concepts step by step How to build networks and its types	PPT	10	
6	Explain with examples Basic Networks	Videos	7	Youtube Source
7	Plan for Q&A session / Activities Building Network and its types	Discussion	3	Quiz
8	Summarization Building Network and its types	PPT	3	
9	Give the topics to be read by students for next class Overview of Internet	PPT	2	

Session Plan

Faculty Name: R.Deepalakshmi

Designation & Department: AP/ECE

Course Code & Name: EC3401- Networks and Security

Academic Year: 2022-2023

Semester: Odd / Even

Class:II Unit: 1

Topics Discussed :OSI Model, Physical Layer

Date of Lecture: 09.02.2023

	Description	Mode of Teaching	Time in Mins	Remarks
1	Recap of Previous Topics/Classes handled Protocol Layering	PPT	5	
2	Brief Explanation of Topics to be handled today OSI Mode, Physical Layer	PPT	2	
3	Explain the concept with analogy OSI Layers	PPT	3	
4	Pre-requisites of the topic layering	PPT	5	
5	Explanation about the topics/concepts step by step OSI Layers	PPT	10	
6	Explain with examples OSI Mode, Physical Layer	Videos	7	Youtube Source
7	Plan for Q&A session / Activities OSI Mode, Physical Layer	Discussion	3	
8	Summarization OSI Mode, Physical Layer	PPT	3	
9	Give the topics to be read by students for next class Overview of Data and Signals	PPT	2	

Session Plan

Faculty Name: R.Deepalakshmi

Designation & Department: AP/ECE

Course Code & Name: EC3401- Networks and Security

Academic Year: 2022-2023

Semester: Odd / Even

Class:II Unit: 1

Topics Discussed :introduction to Data Link Layer

Date of Lecture: 10.02.2023

	Description	Mode of Teaching	Time in Mins	Remarks
1	Recap of Previous Topics/Classes handled Data and Signals	PPT	5	
2	Brief Explanation of Topics to be handled today introduction to Data Link Layer	PPT	2	
3	Explain the concept with analogy OSI Layers	Notes	3	
4	Pre-requisites of the topic Responsibilities of Datalink layer	PPT	5	
5	Explanation about the topics/concepts step by step Responsibilities of datalink layer	PPT	10	
6	Explain with examples introduction to Data Link Layer	PPT	7	
7	Plan for Q&A session / Activities introduction to Data Link Layer	Discussion	3	
8	Summarization introduction to Data Link Layer	PPT	3	
9	Give the topics to be read by students for next class Link layer Addressing	PPT	2	

Faculty Name: R.Deepalakshmi
Course Code & Name: EC3401- Networks and Security
Semester: Odd / Even
Topics Discussed :Error Detection and Correction

Designation & Department: AP/ECE
Academic Year: 2022-2023
Class:II Unit: 1
Date of Lecture: 11.02.2023

	Description	Mode of Teaching	Time in Mins	Remarks
1	Recap of Previous Topics/Classes handled Link layer Addressing	PPT	5	
2	Brief Explanation of Topics to be handled today Error Detection and Correction	PPT	2	
3	Explain the concept with analogy Types of error detection and correction mechanisms	PPT	3	
4	Pre-requisites of the topic Coding	PPT	5	
5	Explanation about the topics/concepts step by step ED/EC mechanisms & its types	Board	10	
6	Explain with examples Error Detection and Correction	Board	7	
7	Plan for Q&A session / Activities Error Detection and Correction	Discussion	3	
8	Summarization Error Detection and Correction	PPT	3	
9	Give the topics to be read by students for next class Overview of Data link Control and Media access control	PPT	2	

Faculty Name: R.Deepalakshmi
Course Code & Name: EC3401- Networks and Security
Semester: Odd / Even
Topics Discussed :Ethernet (802.3)

Designation & Department: AP/ECE
Academic Year: 2022-2023
Class:II Unit: 1
Date of Lecture: 14.02.2023

	Description	Mode of Teaching	Time in Mins	Remarks
1	Recap of Previous Topics/Classes handled Overview of unit 1	PPT	5	
2	Brief Explanation of Topics to be handled today Ethernet (802.3)	PPT	2	
3	Explain the concept with analogy Different generations of ethernet	PPT	3	
4	Pre-requisites of the topic Types of networking	PPT	5	Refer Communication theory
5	Explanation about the topics/concepts step by step Types of uses of Ethernet	PPT	10	
6	Explain with examples Ethernet (802.3)	PPT	7	
7	Plan for Q&A session / Activities Ethernet (802.3)	Discussion	3	
8	Summarization Ethernet (802.3)	PPT	3	
9	Give the topics to be read by students for next class Wireless LANs, Available Protocols	PPT	2	

Faculty Name: R.Deepalakshmi

Designation & Department: AP/ECE

Course Code & Name: EC3401- Networks and Security

Academic Year: 2022-2023

Semester: Odd / Even

Class:II Unit: 1

Topics Discussed: Wireless LANs, Available Protocols, Bluetooth

Date of Lecture: 15.02.2023

Description		Mode of Teaching	Time in Mins	Remarks
1	Recap of Previous Topics/Classes handled Ethernet	PPT	5	
2	Brief Explanation of Topics to be handled today Wireless LANs, Available Protocols	PPT	2	
3	Explain the concept with analogy Different area networks	PPT	3	
4	Pre-requisites of the topic Types of networking	PPT	5	
5	Explanation about the topics/concepts step by step WLAN Concepts and types	PPT	10	
6	Explain with examples Wireless LANs, Available Protocols	PPT	7	
7	Plan for Q&A session / Activities Wireless LANs, Available Protocols	Discussion	3	
8	Summarization Wireless LANs, Available Protocols	PPT	3	
9	Give the topics to be read by students for next class Bluetooth	PPT	2	

Faculty Name: R.Deepalakshmi

Designation & Department: AP/ECE

Course Code & Name: EC3401- Networks and Security

Academic Year: 2022-2023

Semester: Odd / Even

Class:II Unit: 1

Topics Discussed: Flow and Error control protocols

Date of Lecture: 16.02.2023

Description		Mode of Teaching	Time in Mins	Remarks
1	Recap of Previous Topics/Classes handled Wireless LAN	PPT	5	
2	Brief Explanation of Topics to be handled today Packet Switching	PPT	2	
3	Explain the concept with analogy Error control schemes	PPT	3	
4	Pre-requisites of the topic switching	PPT	5	
5	Explanation about the topics/concepts step by step Circuit and packet switching	PPT	10	
6	Explain with examples Packet Switching	PPT	7	
7	Plan for Q&A session / Activities Error control	Discussion	3	
8	Summarization	PPT	3	
9	Give the topics to be read by students for next class IPV4 Address, Network layer protocols (IP, ICMP, Mobile IP)	PPT	2	

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Session Plan

Faculty Name: R.Deepalakshmi

Designation & Department: AP/ECE

Course Code & Name: EC3401- Networks and Security

Academic Year: 2022-2023

Semester: Odd / Even

Class:II Unit: 2

Topics Discussed :IPV4 Address, Network layer protocols (IP, ICMP, Mobile IP)Date of Lecture:17.02.2023

	Description	Mode of Teaching	Time in Mins	Remarks
1	Recap of Previous Topics/Classes handled Packet Switching	PPT	5	
2	Brief Explanation of Topics to be handled today IP, ICMP, Mobile IP	PPT	2	
3	Explain the concept with analogy Network layer protocols	PPT	3	
4	Pre-requisites of the topic protocols	PPT	5	
5	Explanation about the topics/concepts step by step Different network layer protocol concepts	PPT	10	
6	Explain with examples IP, ICMP, Mobile IP	PPT	7	
7	Plan for Q&A session / Activities IP, ICMP, Mobile IP	Discussion	3	
8	Summarization IP, ICMP, Mobile IP	PPT	3	
9	Give the topics to be read by students for next class Routing	PPT	2	

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Session Plan

Faculty Name: R.Deepalakshmi

Designation & Department: AP/ECE

Course Code & Name: EC3401- Networks and Security

Academic Year: 2022-2023

Semester: Odd / Even

Class:II Unit: 2

Topics Discussed :Routing

Date of Lecture: 18.02.2023

	Description	Mode of Teaching	Time in Mins	Remarks
1	Recap of Previous Topics/Classes handled Overview of unit 2	PPT	5	
2	Brief Explanation of Topics to be handled today Routing	PPT	2	
3	Explain the concept with analogy Routing mechanisms	PPT	3	
4	Pre-requisites of the topic OSI Layers	PPT	5	
5	Explanation about the topics/concepts step by step Uses and concepts of routing	PPT	10	
6	Explain with examples Routing	PPT	7	
7	Plan for Q&A session / Activities Routing	Discussion	3	
8	Summarization Routing	PPT	3	
9	Give the topics to be read by students for next class Unicast Routing	PPT	2	

Faculty Name: R.Deepalakshmi

Designation & Department: AP/ECE

Course Code & Name: EC3401- Networks and Security

Academic Year: 2022-2023

Semester: Odd / Even

Class:II Unit: 2

Topics Discussed :Unicast Routing

Date of Lecture: 21.02.2023

	Description	Mode of Teaching	Time in Mins	Remarks
1	Recap of Previous Topics/Classes handled Routing	PPT	5	
2	Brief Explanation of Topics to be handled today Unicast Routing	PPT	2	
3	Explain the concept with analogy Routing mechanisms	PPT	3	
4	Pre-requisites of the topic Routing	PPT	5	
5	Explanation about the topics/concepts step by step Uses and concepts of unicast routing	PPT	10	
6	Explain with examples Unicast Routing	PPT	7	
7	Plan for Q&A session / Activities Unicast Routing	Discussion	3	
8	Summarization Unicast Routing	PPT	3	
9	Give the topics to be read by students for next class Algorithms	PPT	2	

Faculty Name: R.Deepalakshmi

Designation & Department: AP/ECE

Course Code & Name: EC3401- Networks and Security

Academic Year: 2022-2023

Semester: Odd / Even

Class:II Unit: 2

Topics Discussed :Algorithms

Date of Lecture: 22.02.2023

	Description	Mode of Teaching	Time in Mins	Remarks
1	Recap of Previous Topics/Classes handled Unicast Routing	PPT	5	
2	Brief Explanation of Topics to be handled today Algorithms	PPT	2	
3	Explain the concept with analogy Routing algorithms	PPT	3	
4	Pre-requisites of the topic Unicast routing	PPT	5	
5	Explanation about the topics/concepts step by step Concepts of routing algorithms	PPT	10	
6	Explain with examples Algorithms	PPT	7	
7	Plan for Q&A session / Activities Algorithms	Discussion	3	
8	Summarization Algorithms	PPT	3	
9	Give the topics to be read by students for next class Protocols	PPT	2	

Chapter 2 Network Models

2-1 LAYERED TASKS

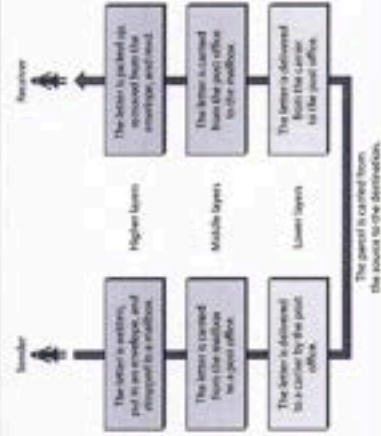
We use the concept of layers in our daily life. As an example, let us consider two friends who communicate through postal mail. The process of sending a letter to a friend would be complex if there were no services available from the post office.

Topics discussed in this section:

- Sender, Receiver, and Carrier
- Hierarchy

2.2

Figure 2.1 Tasks involved in sending a letter



2.3

2-2 THE OSI MODEL

Established in 1947, the International Standards Organization (ISO) is a multinational body dedicated to worldwide agreement on international standards. An ISO standard that covers all aspects of network communications is the Open Systems Interconnection (OSI) model. It was first introduced in the late 1970s.

Topics discussed in this section:

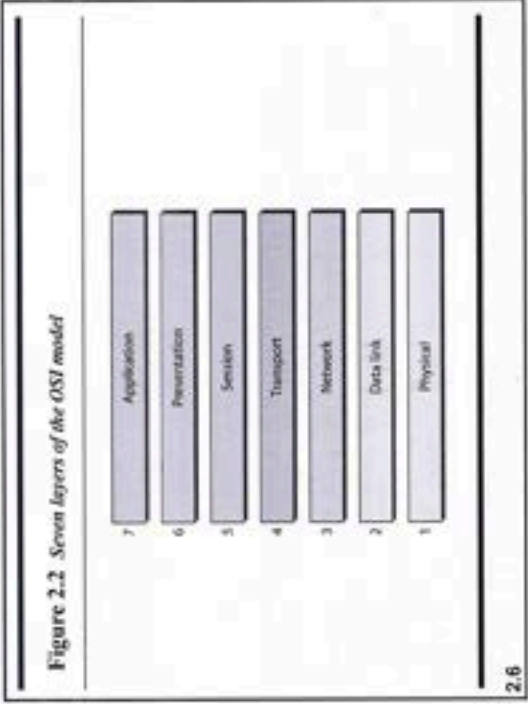
- Layered Architecture
- Peer-to-Peer Processes
- Encapsulation

2.4

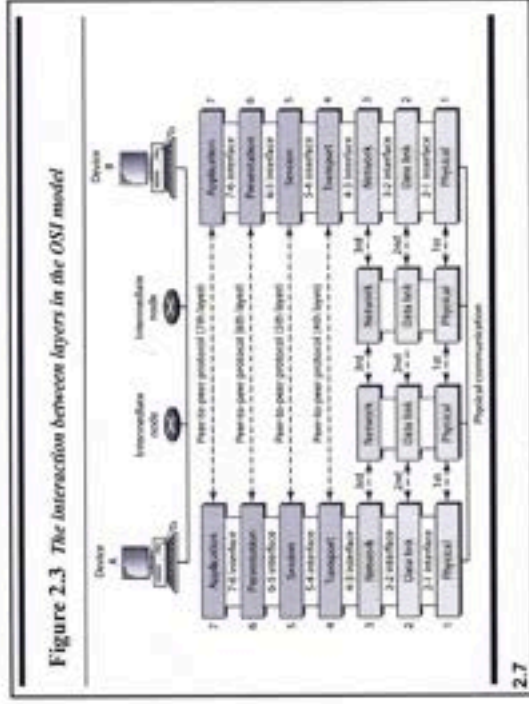
Note

ISO is the organization.
OSI is the model.

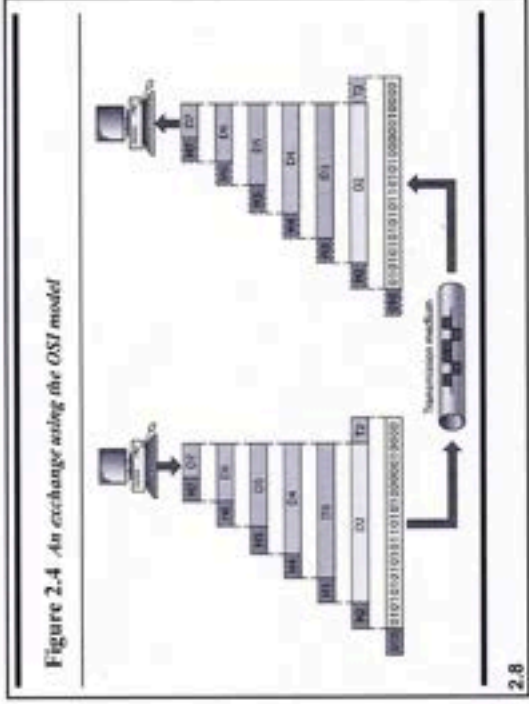
2.5



2.6



2.7



2.8

2-3 LAYERS IN THE OSI MODEL

In this section we briefly describe the functions of each layer in the OSI model.

Topics discussed in this section:

- Physical Layer
- Data Link Layer
- Network Layer
- Transport Layer
- Session Layer
- Presentation Layer
- Application Layer

2.9

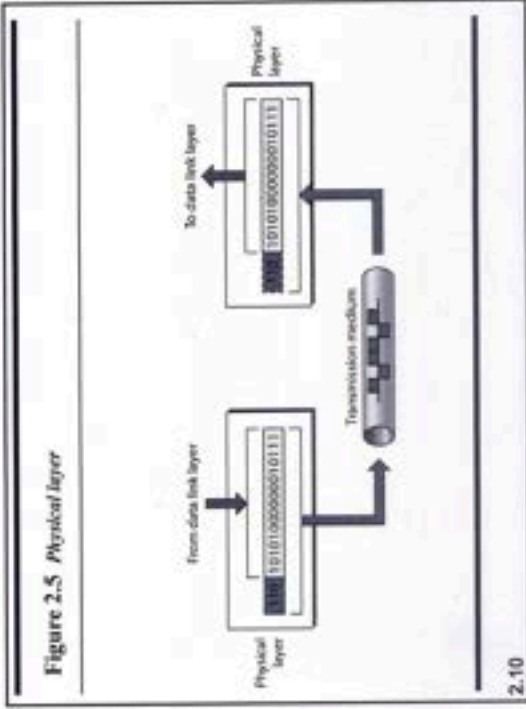


Figure 2.5 Physical layer

2.10

Note

The physical layer is responsible for movements of individual bits from one hop (node) to the next.

2.11

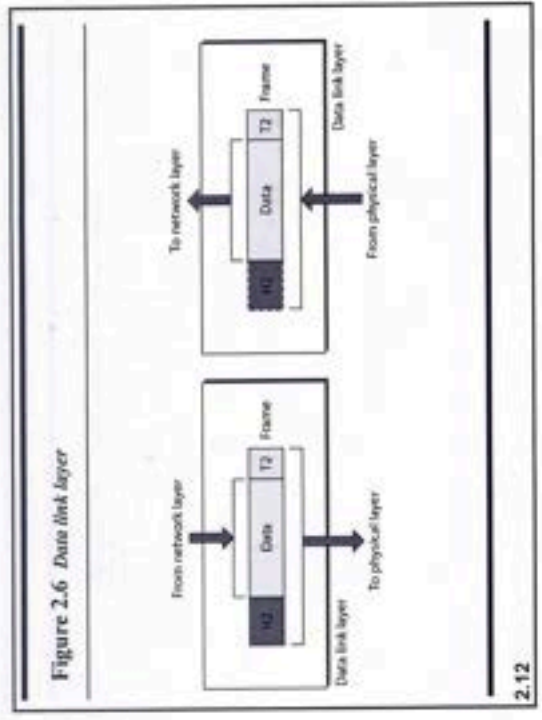


Figure 2.6 Data link layer

2.12

Note

The data link layer is responsible for moving frames from one hop (node) to the next.

2.13

Figure 2.7 Hop-to-hop delivery

2.14

Figure 2.8 Network layer

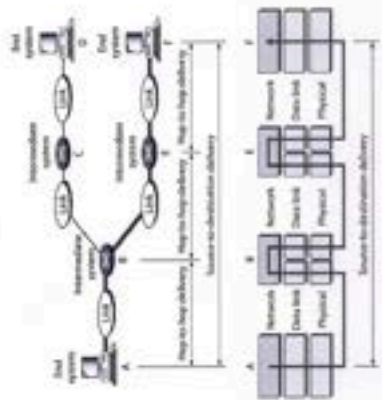
2.15

Note

The network layer is responsible for the delivery of individual packets from the source host to the destination host.

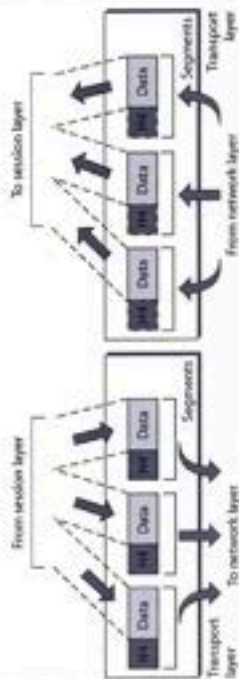
2.16

Figure 2.9 Source-to-destination delivery



2.17

Figure 2.10 Transport layer



2.18

Note
The transport layer is responsible for the delivery of a message from one process to another.

2.19

Figure 2.11 Reliable process-to-process delivery of a message



2.20

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DEPARTMENT OF ECE

Subject : **EC3401 – NETWORKS AND SECURITY**
Year /Semester : **II / IV**
Academic Year : **2022-23 (EVEN SEMESTER)**

SUBJECT : EC3401 NETWORKS & SECURITY**UNIT I - NETWORK MODELS AND DATALINK LAYER**

- Overview of Networks and its Attributes – Network Models – OSI, TCP/IP, Addressing – Introduction to Data Link Layer – Error Detection and Correction – Ethernet(802.3)- Wireless LAN – IEEE 802.11, Bluetooth – Flow and Error Control Protocols – HDLC – PPP.

PART A

Q. No	Questions	BT Level	Competence
1.	Summarize the fundamental characteristics of data communication system.	BTL 2	Understanding
2.	Name the criteria necessary for an effective and efficient network.	BTL 1	Remembering
3.	Show the four basic network topologies.	BTL 3	Applying
4.	State the function of WAN.	BTL 1	Remembering
5.	Interpret the responsibilities of data link layer.	BTL 2	Understanding
6.	Compare the packet-switched and circuit-switched networks.	BTL 3	Applying
7.	What is an Internet?	BTL 1	Remembering
8.	Write about Protocol layering.	BTL 1	Remembering
9.	Identify the purpose of computer networks.	BTL 2	Understanding
10.	Infer about the seven layers of OSI model.	BTL 1	Understanding
11.	Differentiate between half duplex and full duplex.	BTL 3	Applying
12.	Analyze the flow and error control.	BTL 2	Understanding
13.	Distinguish between baseband transmission and broadband transmission.	BTL 1	Remembering
14.	Mention the concerns of physical layer.	BTL 2	Understanding
15.	Define analog and digital signals.	BTL 2	Remembering
16.	Inspect the difference between a port address, a logical address and a physical address.	BTL 2	Understanding
17.	Illustrate error detection and correction?	BTL 3	Applying
18.	Consider that the data word to be transmitted is 100100 and key is 1101. Determine parity bits for the given data.	BTL 3	Applying
19.	Generalize the term checksum.	BTL 3	Applying
20.	Determine the three criteria necessary for an effective and efficient network.	BTL 3	Applying
21.	Mention the functions of data link layer.	BTL 1	Remembering
22.	Show the Ethernet frame format.	BTL 3	Applying
23.	What is the need of escape character?	BTL 1	Remembering
24.	Compare flow and error control.	BTL 3	Applying
25.	State the working principle of stop-and-wait protocol.	BTL 1	Remembering

26	Write the function piggybacking.	BTL 1	Remembering
27	Distinguish between fixed-size framing and variable-size framing.	BTL 2	Understanding
28	How HDLC frame types differ from one another?	BTL 2	Understanding
29	Illustrate the Media access control.	BTL 3	Applying
30	Summarize the different Ethernet generations.	BTL 2	Understanding
31	Identify the goals of Fast Ethernet.	BTL 2	Understanding
32	Point out the advantages of WLAN.	BTL 2	Understanding
33	Define total delay in network layer services.	BTL 1	Remembering
34	Can you relate piconet and scatternet.	BTL 2	Understanding
35	Find the use of Bluetooth.	BTL 1	Remembering

PART – B

1.	Define data communications. Describe the five components of data communications system with necessary diagrams.	(13)	BTL 1	Remembering
2.	Write brief note on the following: (i) Network criteria (ii) physical structures (iii) physical topology	(5) (4) (4)	BTL 1	Remembering
3.	(i) What are the types of network? Explain with necessary diagrams. (ii) You have two computers connected by an Ethernet hub at home. Is this a LAN, a MAN, or a WAN? Explain your reason.	(7) (6)	BTL 1	Remembering
4.	Explain about data and signals and name three types of transmission impairment.	(13)	BTL 1	Remembering
5.	Infer the overview of Internet architecture with necessary diagrams.	(13)	BTL 2	Understanding
6.	Illustrate the mechanism of simple parity check code with your own example.	(13)	BTL 2	Understanding
7.	Interpret the process of two-dimensional parity check with real time example.	(13)	BTL 2	Understanding
8.	Demonstrate what kind of arithmetic is used to add data items in checksum calculation with an example?	(13)	BTL 3	Applying

9.	Given the data word 1010011110 and the divisor 10111, (i) generate the codeword at the sender site (using binary division). (5) (ii) Show the checking of the codeword at the receiver site (assume no error). (4) (iii) Show the checking of the codeword at the receiver site (include error). (4)	(5) (4) (4)	BTL 3	Applying
10.	How can errors be detected by using block coding? Analyze the process of error detection and correction in block coding.	(13)	BTL 3	Understanding
11.	Inspect the responsibilities and concerns of physical layer with neat diagram.	(13)	BTL 2	Understanding
12.	How would you categorize the levels of addresses used in an internet employing the TCP/IP protocols?	(13)	BTL 2	Understanding
13.	(i) Determine the propagation time and the transmission time for a 2.5-kbyte message (an e-mail) if the bandwidth of the network is 1 Gbps? Assume that the distance between the sender and the receiver is 12,000 km and that light travels at 2.4×10^8 m/s. (7) (ii) Draw the structure of CRC encoder and decoder. (6)	(7) (6)	BTL 3	Applying
14.	Discuss in detail about the Forward Error Correction techniques.	(13)	BTL 3	Applying

PART - C

1.	Elaborate the layered architecture of OSI model and assess the functions of each layer.	(15)	BTL 3	Applying
2.	For each of the following four networks, discuss the consequences if a connection fails. (i) Five devices arranged in a mesh topology (4) (ii) Five devices arranged in a star topology (not counting the hub) (4) (iii) Five devices arranged in a bus topology (4) (iv) Five devices arranged in a ring topology (3)	(4) (4) (4) (3)	BTL 3	Applying
3.	(i) How do you find the minimum distance for linear block codes? (5) (ii) Evaluate the performance of any two linear block codes with your own example. (10)	(5) (10)	BTL 3	Applying
4.	In order to transmit the message $M = 111011$ with divisor bit as $C = 1101$ whose polynomial is given by $C(x) = x^3 + x^2 + 1$, Formulate the message that should be transmitted using polynomial long division and predict the occurrence of errors in the receiver.	(15)	BTL 3	Applying
5.	Analyze the different frames and configuration of HDLC protocol.		BTL 2	Understanding

6.	Show the working principle of stop and wait and sliding window mechanism with an example of your own.	BTL 1	Remembering
7.	(i) What is CSMA/CD? How it detects collisions? (ii) State an algorithm of CSMA/CD with real time example.	BTL 1	Remembering
8.	(i) Write brief note on CSMA/CA. (ii) Discuss RTS/CTS protocol with a real time example.	BTL 1	Remembering
9.	(i) Summarize Ethernet standards. (ii) Analyze the characteristics of fast Ethernet and Gigabit Ethernet.	BTL 2	Understanding
10	Illustrate an architecture and MAC layers of IEEE 802.11 with necessary diagrams.	BTL 2	Understanding
11	Draw an architecture diagram for 6LowPAN technology and explain layers.	BTL 1	Remembering

UNIT II - NETWORK LAYER PROTOCOLS

Network Layer – IPv4 Addressing – Network Layer Protocols(IP,ICMP and Mobile IP) Unicast and Multicast Routing – Intradomain and Interdomain Routing Protocols – IPv6 Addresses – IPv6 – Datagram Format – Transition from IPv4 to IPv6.

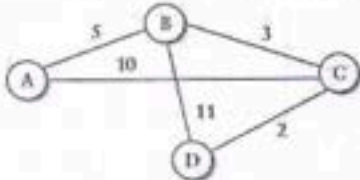
PART – A

Q. No	Questions	BT Level	Competence
1.	Differentiate between basic service set and extended service set.	BTL 2	Understanding
2.	Examine the open-loop Congestion control and closed loop Congestion control.	BTL 3	Applying
3.	Draw the frame format of IPv4.	BTL 3	Applying
4.	Compose the Security issues in IP protocol.	BTL 3	Applying
5.	Develop the protocol to overcome the deficiencies in IP.	BTL 3	Applying
6.	Discuss about Routing.	BTL 2	Understanding
7.	What do you mean by Unicast routing?	BTL 1	Remembering
8.	Illustrate Least-Cost routing.	BTL3	Applying
9.	Explain distance-vector routing.	BTL 1	Remembering
10.	Evaluate Bellman-Ford equation.	BTL 3	Applying
11.	Define Autonomous system.	BTL 1	Remembering
12.	Examine Global routing protocol.	BTL 1	Remembering
13.	Interpret the concept of RIP.	BTL 2	Understanding
14.	Analyze the performance of OSPF.	BTL 2	Understanding
15.	Manipulate the Dijkstra Algorithm.	BTL 3	Applying
16.	Outline the benefits of Open Shortest Path First (OSPF) Protocol.	BTL 2	Understanding
17.	Compare Interdomain and Intradomain routing.	BTL 2	Understanding
18.	State Multicast routing.	BTL 1	Remembering

19.	Generalize the applications of Multicasting.	BTL 2	Understanding
20.	Why IPv6 is preferred than IPv4?	BTL 1	Remembering
21.	Distinguish between RIP and OSPF.	BTL 2	Understanding
22.	Classify the destination address in IPv6.	BTL 3	Applying
23.	Justify the strategies in transition from IPv4 to IPv6.	BTL 3	Applying
24.	Develop a Global unicast address block.	BTL 3	Applying
25.	Integrate the compatible address and mapped address.	BTL 3	Applying

PART - B

1.	(i) Interpret the format of IPv4 datagram header. (7) (ii) Find the netid and the hostid of the following IP addresses. (6) a. 114.34.2.8 b. 132.56.8.6 c. 208.34.54.12	BTL 2	Understanding
2.	Identify the need for network layer and show the functionality of the Network layer at the source, router, and destination. (13)	BTL 3	Applying
3.	How DHCP server dynamically assigns IP address to a host. (13)	BTL 3	Applying
4.	Describe about IP fragmentation and reassembly. (13)	BTL 3	Applying
5.	(i) Evaluate the addressing in Mobile IP. (7) (ii) Assess the Inefficiency in Mobile IP. (6)	BTL 3	Applying
6.	Analyze the various Phases in Mobile IP. (13)	BTL 2	Understanding
7.	(i) Illustrate the classes in classful addressing and define the application of each class with an example. (ii) Find the class of the following IP addresses. a. 208.34.54.12 b. 238.34.2.1 c. 114.34.2.8 d. 129.14.6.8	BTL 3	Applying
8.	Elaborate about Internet Control Message Protocol messages and formulate the important points of error reporting messages. (15)	BTL 3	Applying
9.	Compare and contrast byte-stuffing and bit-stuffing. Which technique is used in byte-oriented protocols and bit-oriented protocols? Justify your answer.	BTL 3	Applying
10.	(i) Assess the two types of networks in Bluetooth architecture. (ii) Evaluate the functions of Bluetooth layers.	BTL 3	Applying

11.	Apply link state routing algorithm for the given network and tabulate the steps for building routing table for node D.		BTL 3	Applying		
12.	Define Unicast routing and its Internet structure with neat diagram. (13)				BTL 1	Remembering
13.	What is reliable flooding and explain how routing takes place in link state routing?				BTL 1	Remembering
14.	Describe in detail about RIP with packet format and example network				BTL 2	Understanding

UNIT III - TRANSPORT AND APPLICATION LAYERS

Transport Layer Protocols – UDP and TCP Connection and State Transition Diagram – Congestion Control and Avoidance(DEC bit, RED)- QoS - Application Layer Paradigms – Client – Server Programming – Domain Name System – World Wide Web, HTTP, Electronic Mail.

Q.No	Questions	BT Level	Competence
1.	What is Transport layer?	BTL 1	Remembering
2.	Differentiate Flow control and Congestion control.	BTL 2	Understanding
3.	Examine the buffers used in transport layer services.	BTL 3	Applying
4.	Show the responsibilities of error control in transport layer.	BTL 3	Applying
5.	Explain Socket Address.	BTL 2	Understanding
6.	Distinguish between UDP and TCP	BTL 2	Understanding
7.	Summarize Stop-and-wait protocol and Go-Back-N protocol.	BTL 2	Understanding
8.	Draw the TCP header format.	BTL 3	Applying
9.	Compare and contrast UDP, TCP, and SCTP.	BTL 2	Understanding
10.	State the features of TCP.	BTL 1	Remembering
11.	Construct the three-way handshaking with an example.	BTL 3	Applying
12.	Give the approaches to improve the QoS.	BTL 3	Applying
13.	Write about SYN Flooding attack.	BTL 1	Remembering
14.	Name the general policies for handling congestion.	BTL 1	Remembering
15.	Assess the ways to deal with congestion.	BTL 3	Applying
16.	Propose the concept of RED.	BTL 3	Applying
17.	Illustrate the services provided by UDP.	BTL 2	Understanding
18.	Define Application layer protocol.	BTL 1	Remembering

19.	Distinguish between network applications and application-layer protocol.	BTL 2	Understanding
20.	Mention the limitations of SMTP.	BTL 3	Applying
21.	Write the name of components used in e-mail system.	BTL 1	Remembering
22.	Illustrate the features of IMAP.	BTL 2	Understanding
23.	Why DNS Resolver bootstrap the domain name lookup process?	BTL 3	Applying
24.	Explain the function of User Agent.	BTL 2	Understanding
25.	Compare HTTP with persistent and Non-persistent Connection.	BTL 2	Understanding
26.	Summarize the applications of RSA.	BTL 2	Understanding
27.	Expand POP3 and IMAP4.	BTL 1	Remembering
28.	Express the classification of firewalls.	BTL 2	Understanding
29.	Construct the Pretty Good Privacy for E-mail security.	BTL 1	Remembering

PART – B

1.	Write short notes on: (i) Process-to-process communication (ii) Addressing (iii) Encapsulation and Decapsulation	(4) (5) (4)	BTL 1	Remembering
2.	Summarize the following: (i) Stop-and-Wait Protocol (ii) Go-Back-N Protocol	(7) (6)	BTL 2	Understanding
3.	Show the services provided by transport layer protocol.	(13)	BTL 3	Applying
4.	Describe the working principle of TCP congestion control.	(13)	BTL 1	Remembering
5.	Explain the services offered by TCP to the process at the application layer.	(13)	BTL 2	Understanding
6.	Analyze the TCP connection with its Three-Way Handshaking.	(13)	BTL 2	Understanding
7.	Examine the State Transition Diagram for TCP.	(13)	BTL 1	Remembering
8.	Manipulate the flow control mechanism of TCP	(13)	BTL 3	Applying
9.	(i) With neat sketches, evaluate the retransmission techniques in detail. (ii) Criticize the events and transitions about the TCP statetransition diagrams.	(7) (6)	BTL 3	Applying
10.	Elaborate on TCP connection Management using neat diagrams.	(13)	BTL 3	Applying
11.	Write in detail the principle of establishment of QoS through differentiated services.	(13)	BTL 1	Remembering
12.	Examine the concept of congestion avoidance in TCP.	(13)	BTL 2	Understanding
13.	Illustrate the principle of flow control mechanism with an example.	(13)	BTL 2	Understanding
14.	(i) Differentiate between UDP and TCP. (ii) Explain the various Queuing Disciplines.	(7) (6)	BTL 3 BTL 2	Applying Understanding

15.	(i) How would you transfer the message using Simple Mail Transfer Protocol? (7) (ii) Explain the final delivery of email to the end user using POP3. (6)	BTL 1	Remembering
16.	Write short notes on (i). Web services (7) (ii) SNMP (6)	BTL 2	Understanding
17.	With appropriate diagram describe (i) DNS (7) (ii) MIME (6)	BTL 3	Applying
18.	(i) Discuss in detail about HTTP with neat diagram. (7) (ii) With relevant examples discuss how the domain space is divided. (6)	BTL 1	Remembering
19.	(i) Prepare a model of IMAP state transition diagram. (7) (ii) Outline the salient features of the SMTP protocol. (6)	BTL 2	Understanding
20.	(i) Illustrate the various steps involved in the use of non-persistent connection of HTTP.(7) (ii) Draw & explain the general format of a HTTP request message and a response message. (6)	BTL 2	Understanding
21.	(i) Define MIME with neat a diagram. (7) (ii) Give the comparison between POP-3 and IMAP-4. (6)	BTL 1	Remembering
22.	(i) Describe the message format, the message transfer and the underlying protocol involved in the working of an electronic mail. (7) (ii) Analyze the architecture and services of an E-mail system. (6)	BTL 3 BTL 2	Applyi ng Underst anding
23.	Evaluate the model for network security with neat diagram. (13)	BTL 3	Applying
24.	(i) Generalize the Traditional application in computer networks. (7) (ii) Explain the role of a DNS on a computer network, including its involvement in the process of a User accessing a web page. (6)	BTL 3	Applying

UNIT IV - NETWORK SECURITY

OSI Security Architecture – Attacks – Security Services and Mechanisms – Encryption –Advanced Encryption Standard – Public Key Cryptosystems – RSA Algorithm – Hash Functions – Secure Hash Algorithm – Digital Signature Algorithm.

Q.No	Questions	BT Level	Competence
1.	What is a security mechanism ?	BTL 1	Remembering
2.	Define an attack.	BTL 2	Understanding
3.	What is a passive attack ?	BTL 3	Applying
4.	What is an active attack ?	BTL 2	Understanding
5.	What are the essential ingredients of a symmetric cipher ?	BTL 2	Understanding

6.	Define symmetric encryption.	BTL 1	Remembering
7.	What is DES ?	BTL 2	Understanding
8.	List out the ingredients of public key encryption scheme.	BTL 3	Applying
9.	Write down the purpose of the S-boxes in DES ?	BTL 2	Understanding
10.	What are the modes of DES ?	BTL 2	Understanding
11.	What is AES cipher ?	BTL 2	Understanding
12.	What is a Hash in cryptography ?	BTL 2	Understanding
13.	What is the use of digital signature ?	BTL 2	Understanding
14.	What is digital signature ?	BTL 2	Understanding

PART – B

1.	Evaluate the model for network security with neat diagram.	BTL 2	Understanding
2.	Inspect the encryption and decryption method used in DES.	BTL 2	Understanding
3.	Explain in detail about the AES with neat diagram.	BTL 2	Understanding
4.	Summarize the Diffie-Helman Cryptosystem.	BTL 2	Understanding
5.	Design the Data Encryption Standard with neat diagram.	BTL 2	Understanding
6.	Compose the firewall and its types with neat diagram.	BTL 3	Applying

UNIT V - HARDWARE SECURITY

Introduction to hardware security, Hardware Trojans, Side – Channel Attacks – Physical Attacks and Countermeasures – Design for Security. Introduction to Blockchain Technology.

Q.No	Questions	BT Level	Competence
1.	Define hardware security?	BTL 3	Applying
2.	What are vulnerabilities ?	BTL 2	Understanding
3.	What is a trusted platform module ?	BTL 2	Understanding
4.	What are hardware Trojans ?	BTL 1	Remembering
5.	Why is Trojan detection is difficult ?	BTL 2	Understanding
6.	What are side channel attacks ?	BTL 3	Applying
7.	List side channel attacks.	BTL 3	Applying
8.	Define blockchain.	BTL 2	Understanding
9.	Define private blockchain.	BTL 2	Understanding
10.	Define public blockchain.	BTL 1	Remembering
11.	Explain attractive properties of blockchain.	BTL 2	Understanding

PART – B

1.	Explain about Digital Signature Algorithm	BTL 3	Applying
2.	Discuss about power analysis attacks	BTL 3	Applying
3.	Write note on design of security	BTL 3	Applying
4.	Discuss about reverse engineering with neat sketches	BTL 2	Understanding
5.	Discuss in detail about the blockchain technology.	BTL 2	Understanding

EC3401 - NETWORK SECURITY QUESTION BANK

TWO MARK QUESTIONS WITH ANSWERS

UNIT 1

1. What are the three criteria necessary for an effective and efficient network?

The most important criteria are performance, reliability and security. Performance of the network depends on number of users, type of transmission medium, the capabilities of the connected h/w and the efficiency of the s/w. Reliability is measured by frequency of failure, the time it takes a link to recover from the failure and the network's robustness in a catastrophe. Security issues include protecting data from unauthorized access and viruses.

2. Group the OSI layers by function.

The seven layers of the OSI model belonging to three subgroups. Network support layers: Consisting of Physical, data link and network layers and they deal with the physical aspects of moving data from one device to another. User support layers: Consists of Session, presentation and application layers and they allow interoperability among unrelated software systems. The transport layer ensures end-to-end reliable data transmission

3. What are the features provided by layering?

- It decomposes the problem of building a network into more manageable components. Rather than implementing a monolithic piece of software that does everything implement several layers, each of which solves one part of the problem.
- It provides more modular design. To add some new service, it is enough to modify the functionality at one layer, reusing the functions provided at all the other layers.

4. What are the two interfaces provided by protocols?

- Service interface
- Peer interface
- Service interface-defines the operations that local objects can perform on the protocol.
- Peer interface-defines the form and meaning of messages exchanged between protocol peers to implement the communication service.

5. What is LAN?

A LAN is a common name used to describe a group of devices that share a geographic location. LAN is limited to single building or campus.

6. What is flow Control?

Flow control refers to a set of procedures used to restrict the amount of data. The sender can send before waiting for acknowledgment.

7. Define Error detection and correction.

Error Detection:

Data can be corrupted during transmission. It is called as an error. For reliable

communication, the receiver must find out the errors occurred in the data which is called as error detection.

Error Correction:

It is the mechanism to correct the errors and it can be handled in 2 ways.

- a) When an error is discovered, the receiver can have the sender retransmit the entire data unit.
- b) A receiver can use an error correcting coder, which automatically corrects certain error.

8. What is the use of two dimensional parity in error detection?

Two-dimensional parity check increases the likelihood of detecting burst errors. It is used to detect errors occurred in more than one bits.

9. What are the issues in data link layer?

The data link layer has a number of specific functions it can carry out. These functions include,

- a) Providing a well-defined service interface to the network layer.
- b) Dealing with transmission errors.
- c) Regulating the flow of data so that slow receivers are not swamped by fast senders.

10. What are the ways to address the framing problem?

The framing problem can be addressed by the following protocols:

- Byte-Oriented Protocols(PPP)
- Bit-Oriented Protocols(HDLC)
- Clock-Based Framing(SONET)

11. What are the responsibilities of data link layer?

Specific responsibilities of data link layer include the following.

- a) Framing
- b) Physical addressing
- c) Flow control
- d) Error control
- e) Access control

12. Mention the types of errors.

There are 2 types of errors

- a) Single-bit error.
- b) Burst-bit error.

13. Define the following terms.

Single bit error: The term single bit error means that only one bit of a given data unit (such as byte character/data unit or packet) is changed from 1 to 0 or from 0 to 1.

Burst error: Means that 2 or more bits in the data unit have changed from 1 to 0 from 0 to 1.

14. What is redundancy?

It is the error detecting mechanism, which means a shorter group of bits or extra bits may be appended at the destination of each unit.

15. What is the purpose of hamming code?

A hamming code can be designed to correct burst errors of certain lengths. So the simple

strategy used by the hamming code to correct single bit errors must be redesigned to be applicable for multiple bit correction.

16. What is meant by error control?

Error control is a method that can be used to recover the corrupted data whenever possible. These are two basic types of error control which are backward error control and forward error control.

17. What is OSI?

A standard that specifies a conceptual model called Open systems Interconnection network interface model, which breaks networked communications into seven layers: Application, Presentation, Session, Transport, Network, Data link, Physical.

18. State the major functions performed by the presentation layer of the ISO OSI model.

(Nov Dec 2006)

Presentation layer is concerned with the format of data exchanged between peers, for example, whether an integer is 16, 32, or 64 bits long and whether the most significant bit is transmitted first or last, or how a video stream is formatted.

19. State the purpose of layering in networks? (May Jun 2007)

A layer is a collection of related functions that provides services to the layer above it and receives services from the layer below it.

To execute the functions by each layer is independent.

20. What are the two fundamental ways by which network performance is measured?

1. Bandwidth
2. Latency

21. What is meant by Ethernet?

Ethernet is a networking technology developed in 1970 which is governed by the IEEE 802.3 specifications.

22. Advantages of Ethernet

1. Inexpensive
2. Easy to install
3. Supports various writing technologies.

23. Identify the class and default subnet mask of the IP address 217.65.10.7.

IP Address 217.65.10.7 belongs to Class C. Its subnet mask is 255.255.255.0.

24. What are the limitations of bridges?

1. Scale
2. Heterogeneity

25. Define Bluetooth.

Bluetooth is a wireless technology standard for exchanging data over short distances (using short-wavelength UHF radio waves in the ISM band from 2.4 to 2.485 GHz) from fixed and mobile devices and building personal area networks (PANs).

26. What are the 3 levels of hierarchy in IP Addressing?

- Netid
- Subnet id
- Hostid

27. What are the functions of bridge?

- Connecting networks
- Filtering information so that network traffic for one portion of the network does not congest the rest of the network.

28. Define sub-netting

Sub-netting is a technique that allows a network administrator to divide one physical network into smaller logical networks and thus control the flow of traffic for security or efficiency reasons.

UNIT - II

1. What are the responsibilities of Network Layer?

The Network Layer is responsible for the source-to-destination delivery of packet possibly across multiple networks (links).

- Logical Addressing b. Routing.

2. What is DHCP?

The Dynamic Host Configuration Protocol has been derived to provide dynamic configuration. DHCP is also needed when a host moves from network to network or is connected and disconnected from a network.

3. Define ICMP

Internet Control Message Protocol is a collection of error messages that are sent back to the source host whenever a router or host is unable to process an IP datagram successfully.

4. What is the need of internetwork?

To exchange data between networks, they need to be connected to make an Internetwork.

5. What are the types of class full addressing?

The types are Class A, Class B, Class C, Class D, and Class E

6. What do you mean by ARP?

ARP stands for Address resolution protocol. ARP is a dynamic mapping method that finds a physical address for a given a logical address. i.e. mapping IP address to physical address.

7. What do you mean by RARP?

RARP stands for Reverse Address resolution protocol, maps a MAC address to an IP address.

8. What are the functions of MAC?

MAC sub layer resolves the contention for the shared media. It contains synchronization, flag, flow and error control specifications necessary to move information from one place to another, as well as the physical address of the next station to receive and route a packet.

9. Define the term medium access control mechanism

The protocol that determines who can transmit on a broadcast channel are called medium access control (MAC) protocol. The MAC protocols are implemented in the Mac sub-layer which is the lower sub-layer of the data link layer.

10. What is bridge?

Bridge is a hardware networking device used to connect two LANs. A bridge operates at data link layer of the OSI reference model.

11. What is a repeater?

Repeater is a hardware device used to strengthen signals being transmitted on a network.

12. Define router

network layer device that connects networks with different physical media and translates between different network architecture.

13. What is a switch?

A switch is a networking device that manages networked connections between devices on a star networks.

14. What is routing?

Routing is a process of selecting paths in a network through which network traffic is sent.

15. Define an internetwork.

A collection of interconnected network is called an internetwork.

16. What does routing metric mean?

A routing metric is a unit calculated by a routing algorithm for selecting or rejecting a routing path for transferring data/traffic.

17. What are the metrics used in determining the best path for a routing protocol?

- Bandwidth
- Delay
- Load
- Reliability
- Cost
- Hop count
- MTU
- Ticks

18. What is multicasting?

Multicasting is the delivery of information to a group of destinations simultaneously using the most efficient strategy to deliver the messages over each link of the network only once.

19. What are different types of multicast routing?

1. Reverse path multicasting
2. Reverse path broadcasting

20. What is multicast? What is the motivation for developing multicast?

Multicasting means delivering the same packet simultaneously to a group of clients. Motivation for developing multicast is that there are applications that want to send a packet to more than one destination hosts.

21. Define RIP.

RIP is a dynamic protocol used for finding the best route or path from end-to-end over a network by using a routing metric/ hop count algorithm.

22. What is OSPF?

OSPF protocol is a router protocol used within larger autonomous system networks in preference to the Routing Information Protocol (RIP).

23. What are the features of OSPF?

- Authentication of routing messages

- Additional hierarchy
- Load balancing

24. Mention any four applications of multicasting

- Broad casts of audio and video
- Video conferencing
- Shared Applications.
- IGMP is used by multicast routers to keep track of membership in a multicast group.

25. Describe the process of routing packets

Routing is the act of moving information across an internetwork from a source to a destination.

26. What are the some routing algorithm types?

The routing types are static, dynamic, flat, hierarchical, host-intelligent, router- intelligent, intra-domain, inter-domain, link state and distance vector.

27. What is a benefit of DHCP?

- Simplicity: clients need to manual configuration.
- Mobility and hosts: Hosts may move between networks without reconfiguring.
- Mobility of network: Possible for internet service providers to reconfigure customers address transparently.
- Save address space if individual clients are not always active.

28. What are the 3 types of routing performed by BGP?

- Inter-autonomous system routing
- Intra-autonomous system routing
- Pass through autonomous system routing

29. What are the different kinds of multicast routing?

- DVMRP
- PIM
- MSDP
- MOSPF
- MBGP

30. Write the types of PIM.

- PIM Sparse mode
- PIM Dense mode

- Bidirectional PIM
- Source Specific Multicast (SSM)

31. How can the routing be classified?

The routing can be classified as,

- Adaptive routing
- Non-adaptive routing.

32. What are the salient features of IPv6?

Salient features are:

- Efficient and hierarchical addressing and routing infrastructures.
- IPv6 networks provide auto configuration capabilities.
- Better support for QOS.
- Large Address space.
- Stateless and stateful address configuration.

33. Write the BGP Message types.

- Open
- Update
- Notification
- Keep-alive

UNIT- III

1. What are the fields on which the UDP checksum is calculated? Why?

UDP checksum includes a pseudo header, the UDP header and the data coming from the application layer.

2. What are the advantages of using UDP over TCP?

- UDP does not include the overhead needed to detect reliability
- It does not need to maintain the unexpected deception of data flow
- UDP requires less processing at the transmitting and receiving of hosts.
- It is simple to use for a network
- The OS does not need to maintain UDP connection information.

2. What is TCP?

TCP provides a connection oriented, reliable byte stream service. The connection oriented means the two applications using TCP must establish a TCP connection with each other before they can exchange data.

3. Define congestion

When too many packets rushing to a node or a part of network, the network performance degrades. This situation is called as congestion.

4. List the flag used in TCP header.

TCP header contains six flags. They are URG, ACK, PSH, RST, SYN, FIN

5. Give the approaches to improve the QoS.

Fine grained approaches, which provide QoS to individual applications or flows. Integrated services, QoS architecture developed in the IETE and often associated with RSVP.

6. What do you mean by QoS?

Quality of Service is used in some organizations to help provide an optimal end user experience for audio and video communications. QoS is most commonly used on networks where bandwidth is limited with a large number of network packets competing for a relatively small amount of available and width.

7. What is multiplexing?

The job of gathering data chunks at the sources host from different sockets, encapsulating each data chunks with header information to create segments, and passing the segments to the network layer is called multiplexing.

8. What is de-multiplexing?

The job of delivering the data in a transport layer segment to the correct socket is called de-multiplexing.

9. What is RTT?

RTT is an acronym for Round Trip Time: it is a measure of the time it takes for a packet to travel from a computer, across a network to another computer, and back.

10. What is the segment?

Transport layer protocols send data as a sequence of packets. In TCP/IP these packets are called segments.

11. What is a port?

Applications running on different hosts communicate with TCP with the help of a concept called as ports. A port is a 16 bit unique number allocated to a particular application.

12. List the services of end to end services.

- Guarantee message delivery.
- Delivery messages in the same order they are sent.
- Deliver at most one copy of each message.
- Support arbitrarily large message.
- Support synchronization.

13. What is congestion?

When load on network is greater than its capacity, there is congestion of data Packets. Congestion occurs because routers and switches have queues or buffers.

14. What are the functions of transport layer?

- Breaks messages into packets.
- Connection control.
- Addressing.
- Provide reliability.

15. What are the types of QoS tools?

Classification Congestion management,

- Congestion avoidance
- Shaping/policing
- Link efficiency

16. List some ways to deal with congestion

- packet elimination
- Flow control
- Buffer allocation
- Choke packets

17. Define network congestion?

When two or more nodes would simultaneously try to transmit packets to one node there is a high probability that the number of packets would exceed the packet handling capacity of the network and lead to congestion.

18. List the three types of addresses in TCP/IP.

Three types of addresses are used by systems using the TCP/IP protocol: the physical address, the internetwork address (IP address), and the port address.

19. What is the flow characteristics related to QoS?

The flow characteristics related to QoS are

- Reliability
- Delay
- Jitter
- Bandwidth

20. What are the techniques to improve QoS?

The techniques to improve QoS are

- Scheduling
- Traffic shaping
- Resource reservation
- Admission control

21. **Define Socket address.**

The combination of IP address and port address is called Socket address.

22. **What are the two types of protocols used in Transport layer?**

The two types of protocols used in Transport layer are

- TCP
- UDP

23. **Define Throughput.**

It is defines as a number of packets passing through the network in a unit of time.

24. **Define UDP**

User datagram protocol is a Unreliable, connectionless protocol, used along with the IP protocol.

25. **What is the need of port numbers?**

Port numbers are used as an addressing mechanism in transport layer.

26. **What are the types of port numbers used in transport layer?**

- Well-known port
- Registered port
- Dynamic port

27. **Why TCP services are called Stream delivery services?**

TCP allows the sending process to deliver data as a stream of bytes and the receiving process to deliver data as a stream of bytes. So it is called as stream of bytes.

28. **Define jitter**

Jitter is defined as a variation in the delay of received packets. The sending side transmits packets in a continuous stream and spaces them evenly apart. Because of network congestion, improper queuing, or configuration errors, the delay between packets can vary instead of remaining constant.

29. **Compare connectionless service & connection oriented service**

In connection less service there is no connection between transmitter & receiver Ex: UDP

In connection oriented service there is a connection between transmitter & receiver Ex: TCP

30. **What is Unicast & Multicast communication?**

- **Unicast communication** is one source sending a packet to one destination.
- **Multicast communication** is one source sending a packet to multiple destinations.

31. **Define the two types of user agents in the electronic mail system**

- **Command driven:** It normally accepts a one character command from the keyboard to perform its task.
- **GUI based:** They contain GUI components that allow the user to interact with the software by using both the keyword and mouse.

32. **What is DNS?**

DNS is a client/server application that identifies each host on the internet with a unique user friendly name.

33. **What is the purpose of inverse domain?**

The inverse domain is used to map an address to a name.

34. **What is SMTP?**

Simple Mail Transfer Protocol is a standard and reliable host to host mail transport protocol that operates over the TCP port 25.

35. State the Purpose of SNMP

The primary purpose of SNMP is to allow the network administrator to monitor and configure devices on the network, remotely via the network. These configuration and monitoring capabilities are collectively referred to as management.

36. What is the Domain name system responsible for?

The Domain Name system converts domain names (of the form www.vtubooks.com) into IP numbers.

37. What are the four main properties of HTTP?

- Global Uniform Resource Identifier
- Request response exchange.
- Statelessness.
- Resource meta data

38. What is SMTP used for?

SMTP is used when email is delivered from an email client, such as Outlook Express, to an email server or when email is delivered from one email server to another.

39. What is virtual terminal?

A virtual terminal is a data structure maintained by either the application software or a local terminal.

40. What are the basic functions of email?

Composition, Transfer, Reporting, Displaying and Disposition of mails.

41. Define WWW?

It is an internet application that allows users to view web pages and move from one web page to another.

42. What is the web browser?

Web browser is a software program that interprets and displays the contents of HTML web pages.

43. What is URL?

URL is a string identifier that identifies a page on the World Wide Web.

44. What do you mean by TELNET?

TELNET is used to connect remote computers and issue commands on those computers.

45. What are the responsibilities of Application Layer?

The Application Layer enables the user, whether human or software, to access the network. It provides user interfaces and support for services such as e-mail, shared database management and other types of distributed information services

- Network virtual Terminal,

- File transfer, access and Management (FTAM),
- Mail services,
- Directory Services

46. Write down the three types of WWW documents.

The documents in the WWW can be grouped into three broad categories: static, dynamic and active.

- A) *Static*: Fixed-content documents that are created and stored in a server.
- B) *Dynamic*: Created by web server whenever a browser requests the document.
- C) *Active*: A program to be run at the client side.

47. What is fully Qualified Domain Name?

If a label is terminated by a null string is called a Fully Qualified Domain Name.

48. What is Generic Domains?

Generic domain defines registered hosts according to their generic behavior. Each node in the tree defines a domain, which is an index to the domain name space database. Eg.-

- com – Commercial organizations,
- edu - Educational institutions,
- gov – Government Institutions.

49. What is simple mail transfer protocol?

The TCP/IP protocol that supports electronic mail on the internet is called Simple Mail Transfer Protocol (SMTP). It is a system for sending messages to other computer users based on email addresses.

50. What do you mean by File transfer protocol?

It is a standard mechanism provided by the internet for copying a file from one host to another.

51. What are the two types of connections in FTP?

The two types of connections in FTP are

- Control connection
- Open connection

52. Define HTTP.

It is used mainly to access data on the World Wide Web. The protocol transfers data in the form of plaintext, hypertext, audio, video and soon.

53. What are the types of messages in HTTP transaction?

The types of messages in HTTP transaction are

- Request messages
- Response messages

54. What are the parts of a browser?

The parts of a browser are

- A controller
- A client program
- Interpreter

55. Name the four aspects of security.

- Privacy
- Authentication
- Integrity
- Non-repudiation

56. Why is an application such as POP needed for electronic messaging?

Workstations interact with the SMTP host, which receives the mail on behalf of every host in the organization, to retrieve messages by using a client-server protocol such as Post Office Protocol, version 3(POP3). Although POP3 is used to download messages from the server, the SMTP client still needed on the desktop to forward messages from the workstation user to its SMTP mail server.

IMPORTANT 16 MARKS WITH KEY POINTS

UNIT -I

57. Explain ISO/OSI reference model.

- 57.1. Physical layer
- 57.2. D
ata link layer
- 57.3. N
etwork layer
- 57.4. T
ransport layer
- 57.5. S
ession layer
- 57.6. P
resentation layer
- 57.7. A
pplication layer

58. Explain the topologies of the network.

- 58.1. Mesh topology
- 58.2. Star topology
- 58.3. Tree topology
- 58.4. Bus topology
- 58.5. Ring topology

59. Explain the categories of networks.

- 59.1. Local Area Network(LAN)
- 59.2. Metropolitan Area Network(MAN)
- 59.3. Wide Area Network(WAN)

60. Explain error detection and error correction techniques.

Types of errors

- 60.1. Single bit error
- 60.2. Burst error
- Error
detection
- 60.3. Vertical redundancy check(VRC)
- 60.4. Longitudinal redundancy check(LRC)
- 60.5. Cyclic redundancy check(CRC)
- 60.6. Checksum
- Error
correction
- 60.7. Single-bit error correction
- 60.8. Hamming code

60.9. Burst error correction

61. Explain error control mechanism.

- 61.1. Stop and wait ARQ
- 61.2. Sliding window ARQ
- 61.3. Go back-n
- 61.4. Selective-reject

62. Explain detail about IEEE 802.3 MAC sub-layer

- Frame format
- Frame length
- Ethernet specifications
- Manchester encoding
- Binary exponential Back off algorithm
- Ethernet performance

63. Explain detail about Bluetooth architecture

- Radio layer
- Baseband layer
- Frame format
- L2CAP
- Hidden Station Problem

64. Explain about Ethernet.

- Access method : CSMA/CD Addressing
- Electrical specification
- Frame format Implementation:
 - 10 base 5:Thick Ethernet
 - 10 base 2: Thin Ethernet,
 - 10 base T : Twisted-pair Ethernet
 - 1 base 5 : Star LAN

UNIT - II

1. Explain about IPv4 address

- Classful addressing Special IP
- addressing Classless addressing
- Header format

- IP fragmentation Options
- Sub-netting a network

2. Explain about Address resolution protocol Packet format

- Encapsulation
- Proxy ARP

3. Explain about RARP

- Frame Format of RARP
- Encapsulation

4. Explain about Internet Control Message Protocol

- Message types
- Message format
- Error Reporting

Echo Request and reply
Time stamp request and reply
Address mask request and
reply message.

5. Explain IP addressing method.

Internetwork protocol (IP) Datagram
Addressing Classes
Dotted decimal notation

6. Define routing & explain distance vector routing and link state routing.

Distance vector routing

Sharing information

Routing table:

Creating the table

Updating the table:

Updating algorithm

Link state routing:

Information sharing

Packet cost

Link state packet:

Getting information about neighbors

Initialization Link state database

7. Define bridge and explain the type of bridges.

Bridges:

Types of bridges

Simple bridge

Multi-port bridge

Transparent bridge

8. Explain sub-netting

Three levels of hierarchy masking

Masks without sub-netting

Masks with sub-netting

Finding the sub-network address

Boundary level masking
Non-boundary level masking

9. Write short notes about repeaters, routers and gateways.

Repeaters
Routers: Routing concepts
Least-cost routing
Non adaptive routing
Adaptive routing
Packet lifetime
Gateways

UNIT- III

1. Explain the duties of transport layer.

End to end delivery
Addressing
Reliable delivery
Error control
Sequence control
Loss control
Duplication control
Flow control
Multiplexing

2. Explain UDP & TCP.

User Datagram Protocol (UDP)
Source port address
Destination port address
Total length
Checksum

Transmission Control Protocol (TCP)
Source port address
Destination port address
Sequence number
Acknowledgement number
Header length
Reserved Control
Window size
Check sum
Urgent pointer
Options and padding

3. Explain about congestion control.

Congestion Control

BECN

FECN

Four situations

Discarding

4. Explain about Congestion Avoidance

DECbit scheme

RED

5. Explain detail about QoS Policing

Integrated service

Traffic Shaping

Admission Control

RSVP

Differentiated Services/QoS

6. Write short notes on FTP.

Transfer a file from one system to another.

TCP connections

Basic model of FTP

7. Explain about HTTP.

HTTP transactions

HTTP messages

URL

8. Explain the WWW in detail.

Hypertext & Hypermedia

Browser Architecture

Categories of Web Documents

HTML

CGI Java

9. Explain about Electronic mail

Email addressing

Message headers

Formatted email

Functions of email

User agent and message transfer agent

Simple mail Transfer protocol

Multipurpose internet mail extensions

Post Office Protocol (POP)

IMAP

10. Explain detail about Domain Name System

Components of DNS

DNS in the internet Name space

Domain name Space Resolution
Message format Resource records
Name servers
Dynamic Domain Name system (DDNS)

UNIT- IV

1. What is a security mechanism ?

A security mechanism is any process that is designed to detect, prevent or recover from a security attack

2. Define an attack.

An attack on system security that derives from an intelligent threat: That is an intelligent act that is a deliberate attempt to evade security services and violate the security policy of a system.

3. What is a passive attack ?

Passive attacks are in the nature of eavesdropping on, or monitoring of, transmissions. Two types of passive attacks are release of message contents and traffic analysis.

4. What is an active attack ?

An active attack involves some modification of the data stream or the creation of a false.

5. What are the essential ingredients of a symmetric cipher ?

A symmetric encryption scheme has five ingredients Plaintext, Encryption Algorithm, Secret key, Ciphertext, Decryption algorithm

6. Define symmetric encryption.

In symmetric encryption, sender and receiver use the same key for encryption and decryption.

7. What is DES ?

DES is a symmetric cipher. DES to a brute force attack utilizes a 56-bit key. This key size is vulnerable using current technology

8. List out the ingredients of public key encryption scheme.

Ingredients of public key encryptions are

- a) Plaintext
- b) Encryption algorithm
- c) Public key
- d) Private key
- e) Cipher-text
- f) Decryption algorithm

9. Write down the purpose of the S-boxes in DES ?

In S-box, each row defines a of 8 general reversible substitution. It consists of a set S-boxes, each of which accepts 6 bits as input and produces 4 bits as output

10. What are the modes of DES ?

Five standard modes of operation:

1. Electronic Code Book (ECB)
2. Cipher Block Chaining (CBC)
3. Cipher Feedback (CFB)
4. Output Feed (OFB)
5. Counter (CTR)

11. What is AES cipher ?

Advanced Encryption Standard (AES) is a symmetric key block cipher. AES is a non-Feistel cipher that encrypts and decrypts a data block of 128 bits. The key size can be 128, 192 or 256 bits. It depends on number of rounds. The number of rounds: 10 rounds for 128 bits, 12 rounds for 192 bits, and 14 rounds for 256 bits.

12. What is a Hash in cryptography ?

A hash function H is a transformation that takes a variable-size input m and returns a function with just this property have a variety of general fixed-size string, which is called the hash value h (that is, $H(m)$). Hash computational uses, but when employed in cryptography the hash functions are usually chosen to have some additional properties.

13. What is the use of digital signature ?

Data appended to, or a data unit that allows a recipient of the data unit to prove the source and integrity of the data unit and protect against forgery.

14. What is digital signature ?

Digital signature is an authentication mechanism that enables the creator of a message to attach a code that acts as a signature.

UNIT- V

1. Define hardware security?

Hardware security is the protection of physical devices from threats that would facilitate unauthorized access to enterprise systems.

2. What are vulnerabilities ?

Vulnerabilities refers to weakness in the hardware architecture, implementation or design/test process, which can be exploited by an attacker to mount an attack. Typical attack consists of an identification of one or more vulnerabilities, followed by exploiting them for successful attack.

3. What is a trusted platform module ?

Trusted platform module (TPM) technology helps keep PCs secure by offering hardware-level protection against malware and sophisticated cyberattacks. TPM technology can be embedded into modern CPUs and securely store artifacts used to authenticate the platform.

4. What are hardware Trojans ?

Hardware Trojan is a malicious modification to a circuit. The Trojan may control, modify, disable or monitor the contents and communications of the underlying computing device.

5. Why is Trojan detection is difficult ?

The inherent opaqueness of the IC internals hinders detection of the modified components; conventional parametric IC testing methods have a limited effectiveness because of the classic observability issues, and destructive tests and IC RE are slow and expensive.

6. What are side channel attacks ?

Side-channel attacks exploit the leakage of secret information through a physical modality when an application is being executed on a system. Side-channel attacks are powerful and have been able to break most existing important cryptographic algorithm.

7. List side channel attacks.

Five commonly exploited side-channel emissions are power consumption, electro-magnetic, optical, acoustic, timing and delay.

8. Define blockchain.

Blockchain technology is a decentralized, distributed ledger that stores the record of ownership of digital assets. Any data stored on blockchain is unable to be modified, making the technology a legitimate disruptor for industries like payments, cyber-security and healthcare.

9. Define private blockchain.

In a private blockchain, write permissions organization are kept centralized to one. In this system the access and permissions are tightly controlled and rights to modify are restricted to the central authority.

10. Define public blockchain.

A public blockchain is a fully decentralized platform where anyone can read and send transactions. The valid transactions are included in the ledger.

11. Explain attractive properties of blockchain.

- Log of data with digital signature
- Immutable Cryptographically secure , privacy preserving
- Provides a basis for trusted computing on top of which applications can be built.

Department of ECE

Branch: ECE

Year: II

Sem: IV

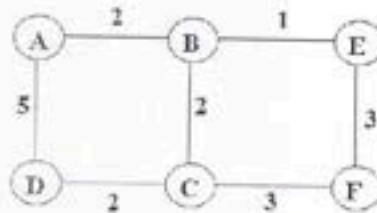
Batch: 2021-2025

Course Code & Name: EC3401 NETWORKS & SECURITY

Faculty In-charge: R.DEEPALAKSHMI

Assignment – I Questions

1. How do you differentiate different layers of OSI Layers and Explain its individual functionalities? (BTL - K2)
2. Explain the function of Distance vector routing protocol for this given figure (BTL - K3)



- a) Each node know only the distance to its immediate neighbors
- b) Share the Information it had to its immediate neighbors
- c) Step(b) Happens second time


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ASSIGNMENT

NETWORK & SECURITY

Done by:-

Helen Prilla. X

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1). ISO/OSI layer:-

* The International standards organization (ISO) is a multinational body dedicated to worldwide agreement on International standards. It created a model called open system Interconnection which allows different systems to communicate

* An open system is a set of protocols that allows any two different systems to communicate regardless of their underlying architecture.

* OSI is a model for understanding and designing a network architecture that is flexible, robust and interoperable.

Layered Architecture:-

- 1). ~~Physical~~ Application layer
- 2). presentation layer
- 3). session layer
- 4). Transport layer
- 5). Network layer
- 6). Data link layer
- 7). Physical layer.

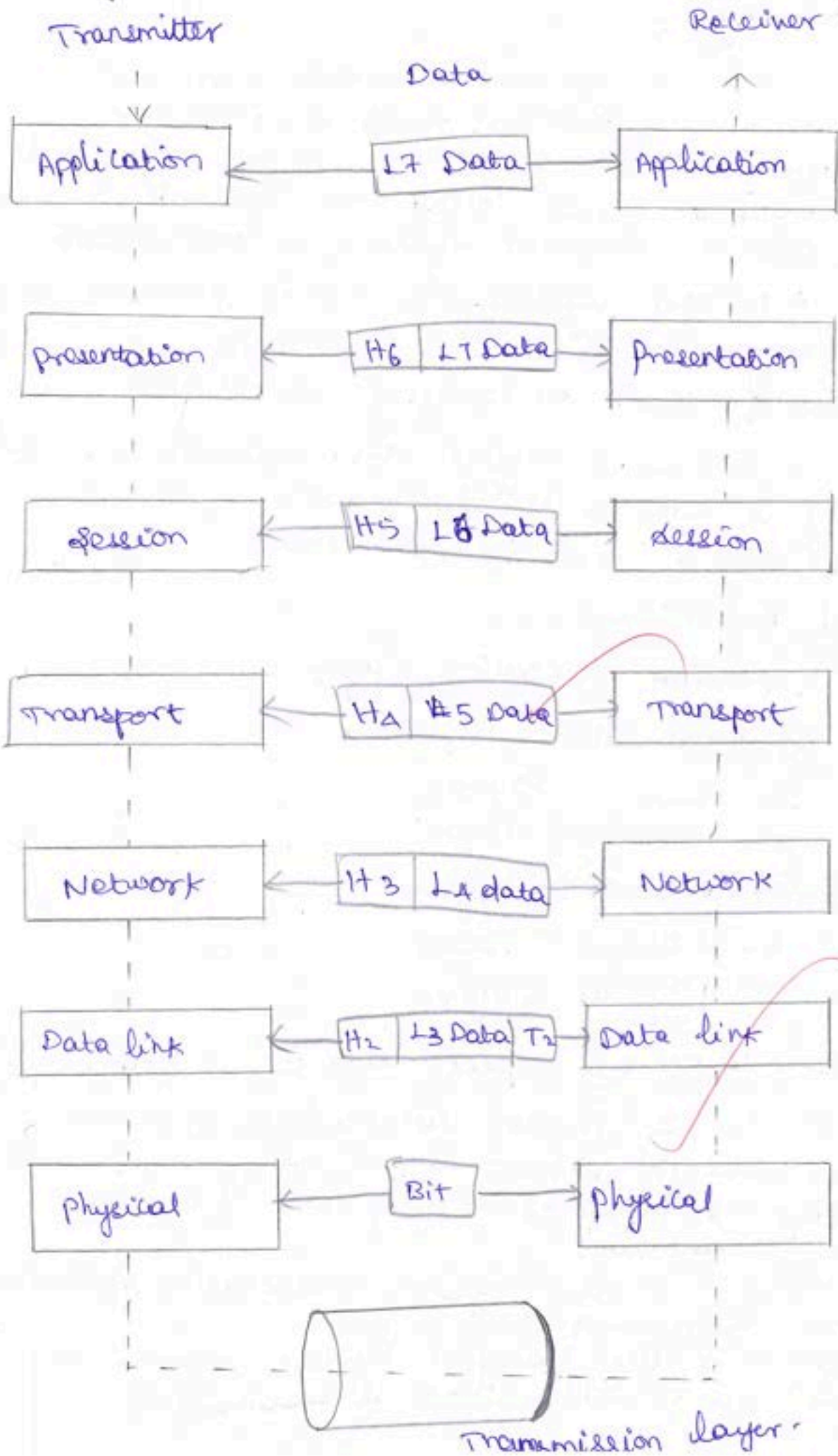
The seven layers are split into three subgroups:-

i). layers 1, 2, 3 (physical, data link & network) are the network support layers, they deal with the physical aspects of moving data from one device to another.

ii). layers 5, 6 and 7 (session, presentation, application) are the user supporter layers.

iii). layer 4, the transport layer ensures an end to end reliable data transmission.

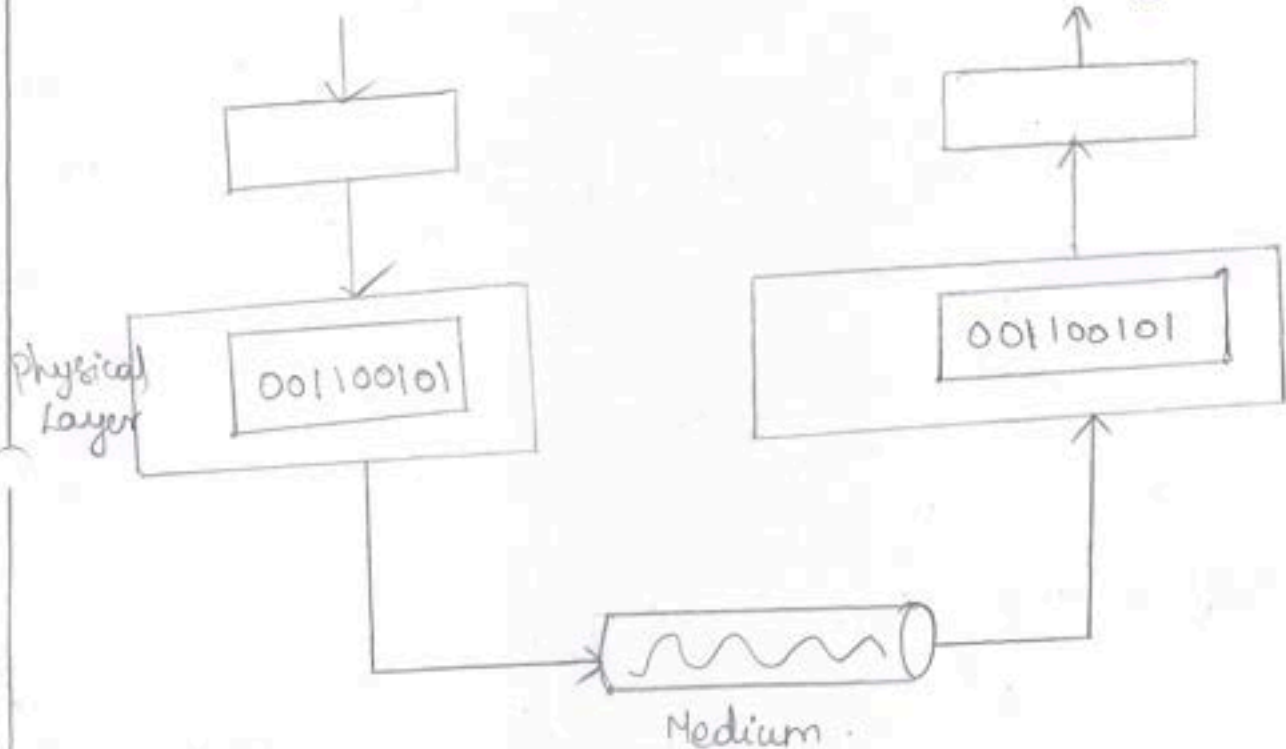
OSI layer with header:-



Physical layer :-

From Data link layer

To Data link layer

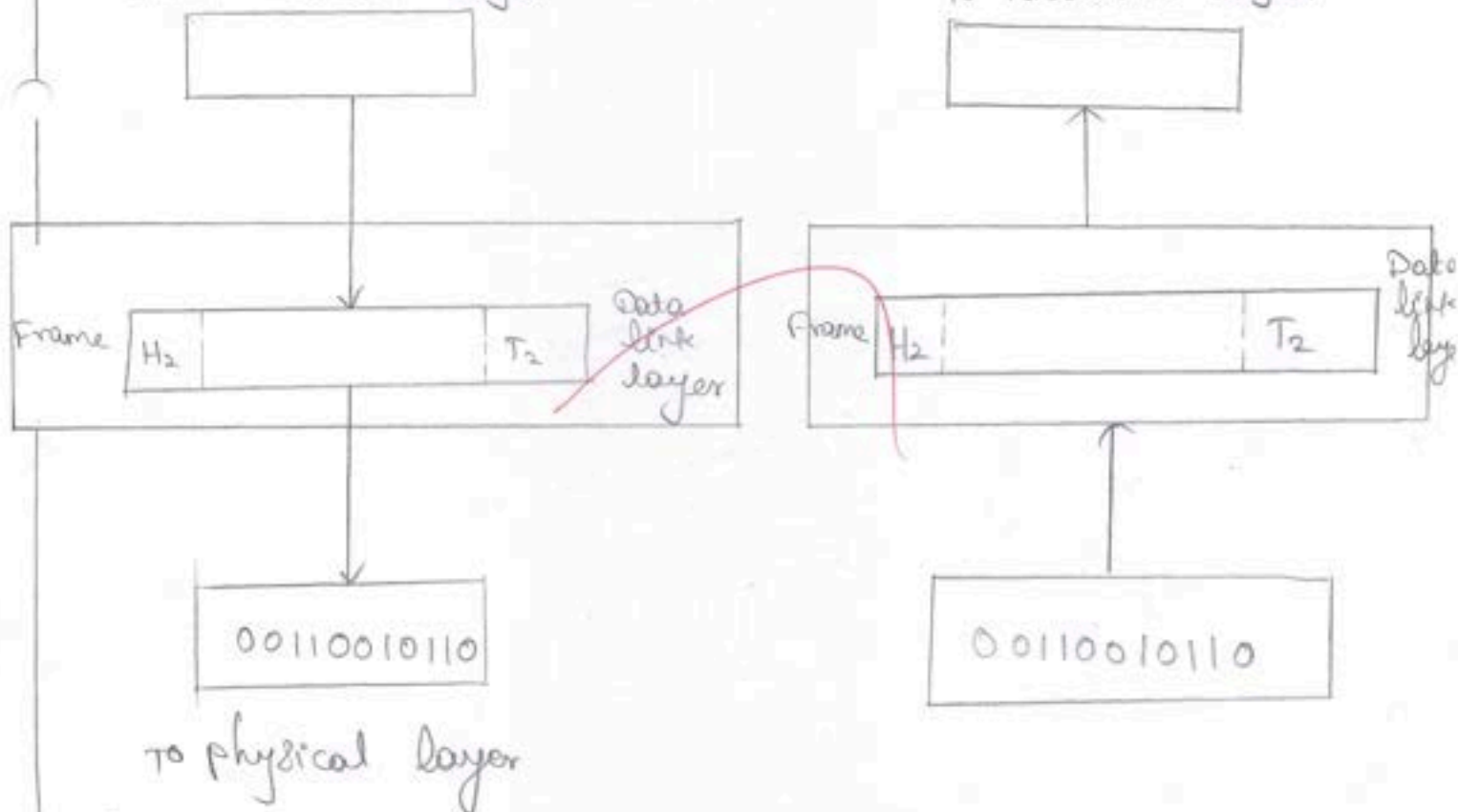


Physical layer between adjacent nodes

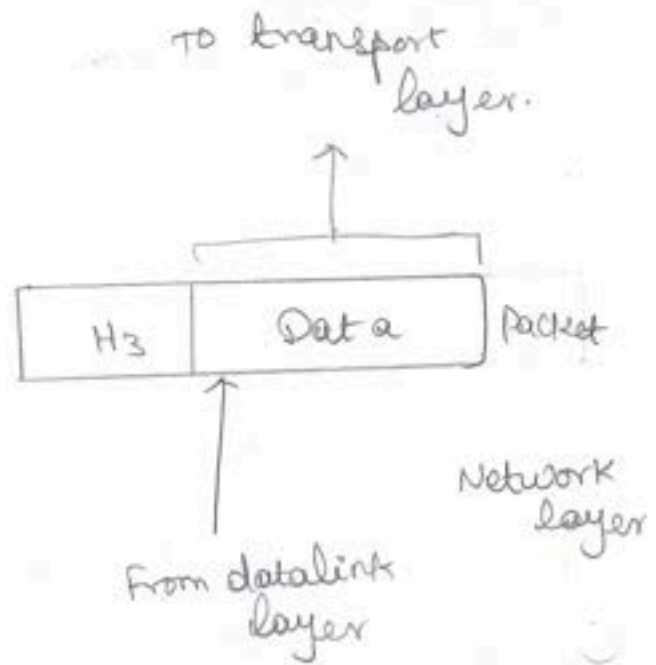
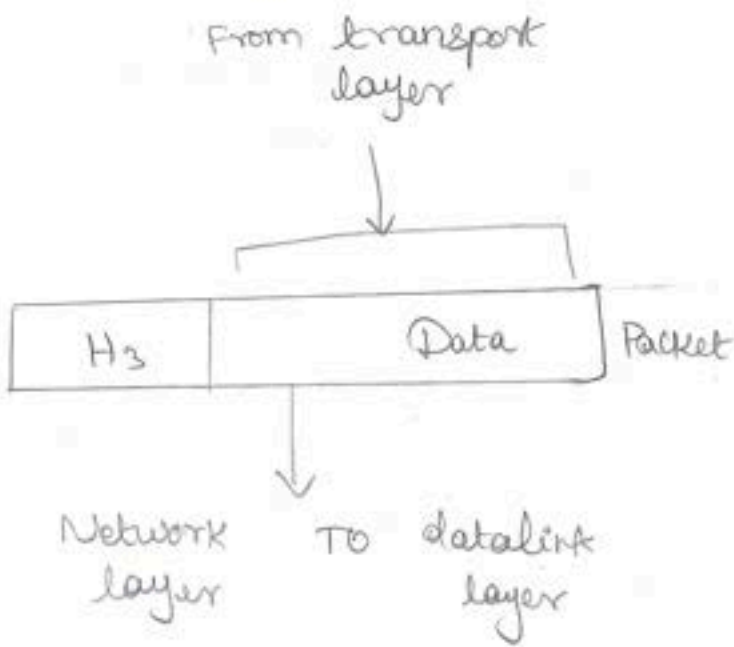
Data link layer :-

From Network layer

To Network layer

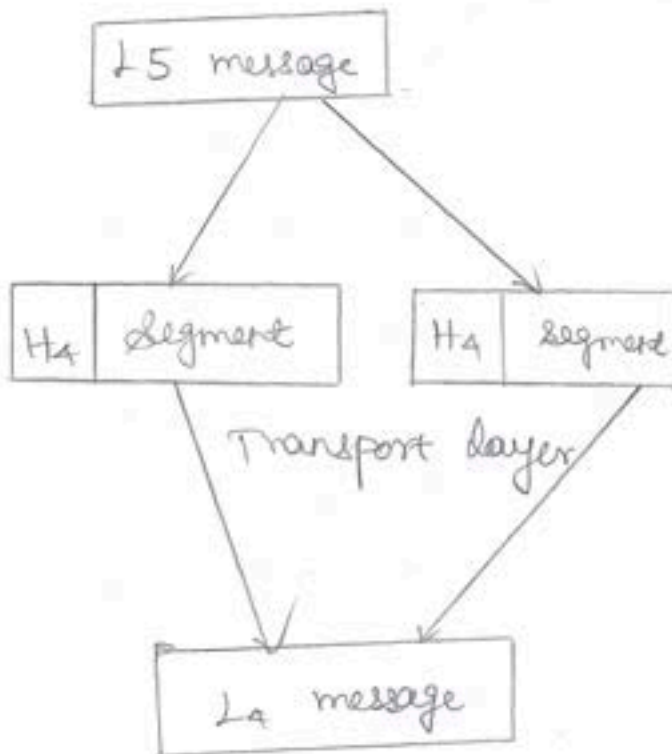


Network layer :-



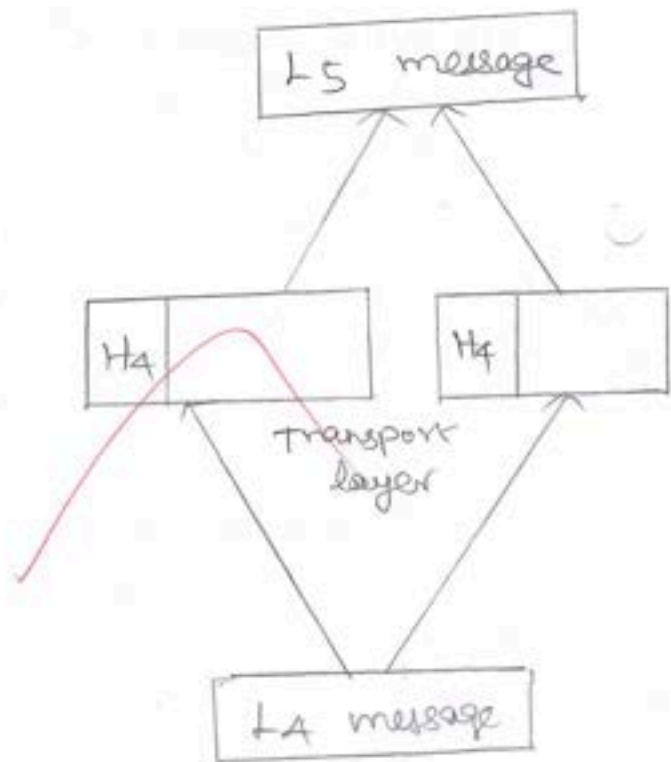
Transport layer :-

From session layer



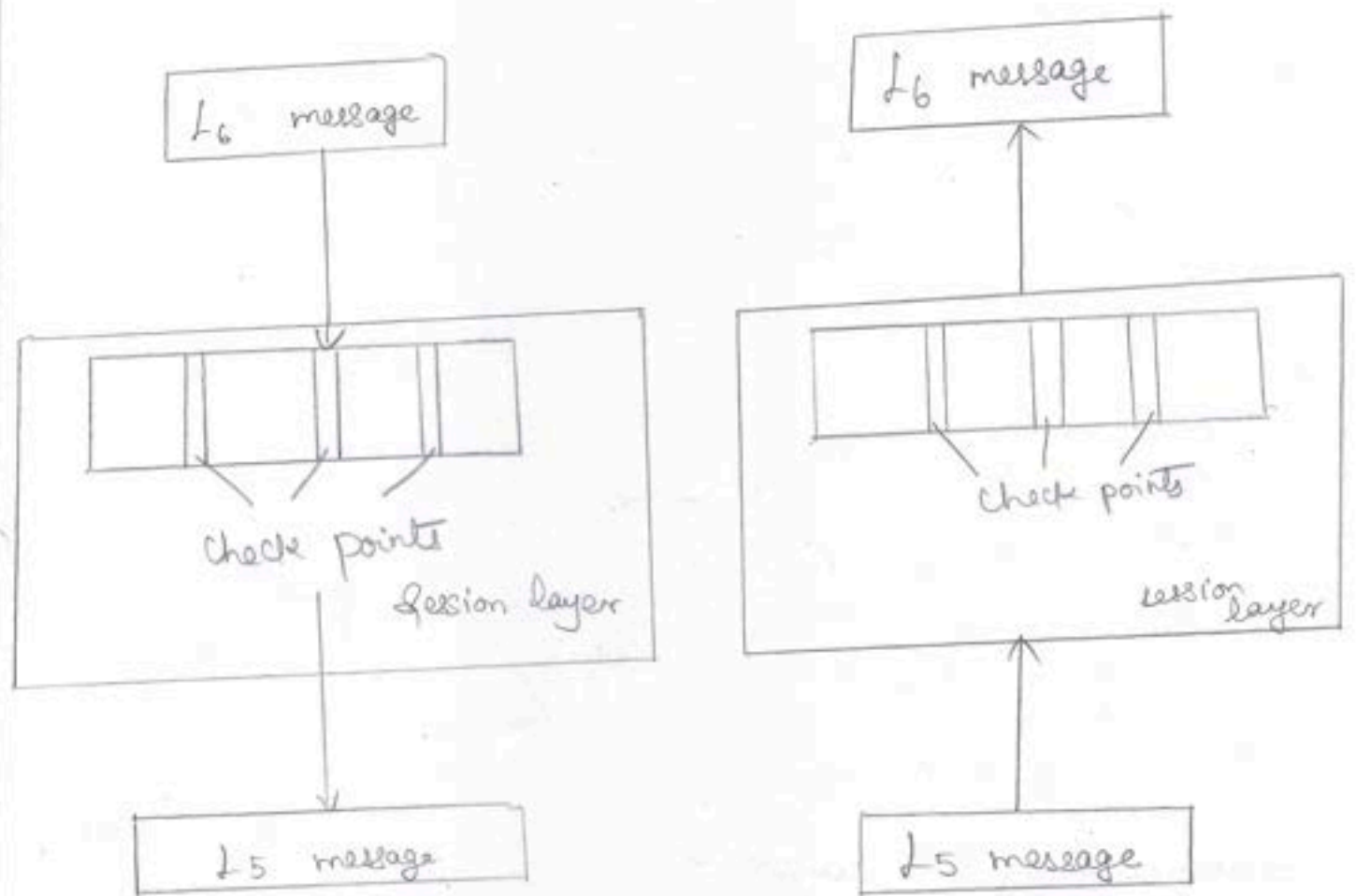
TO Network layer

TO session layer



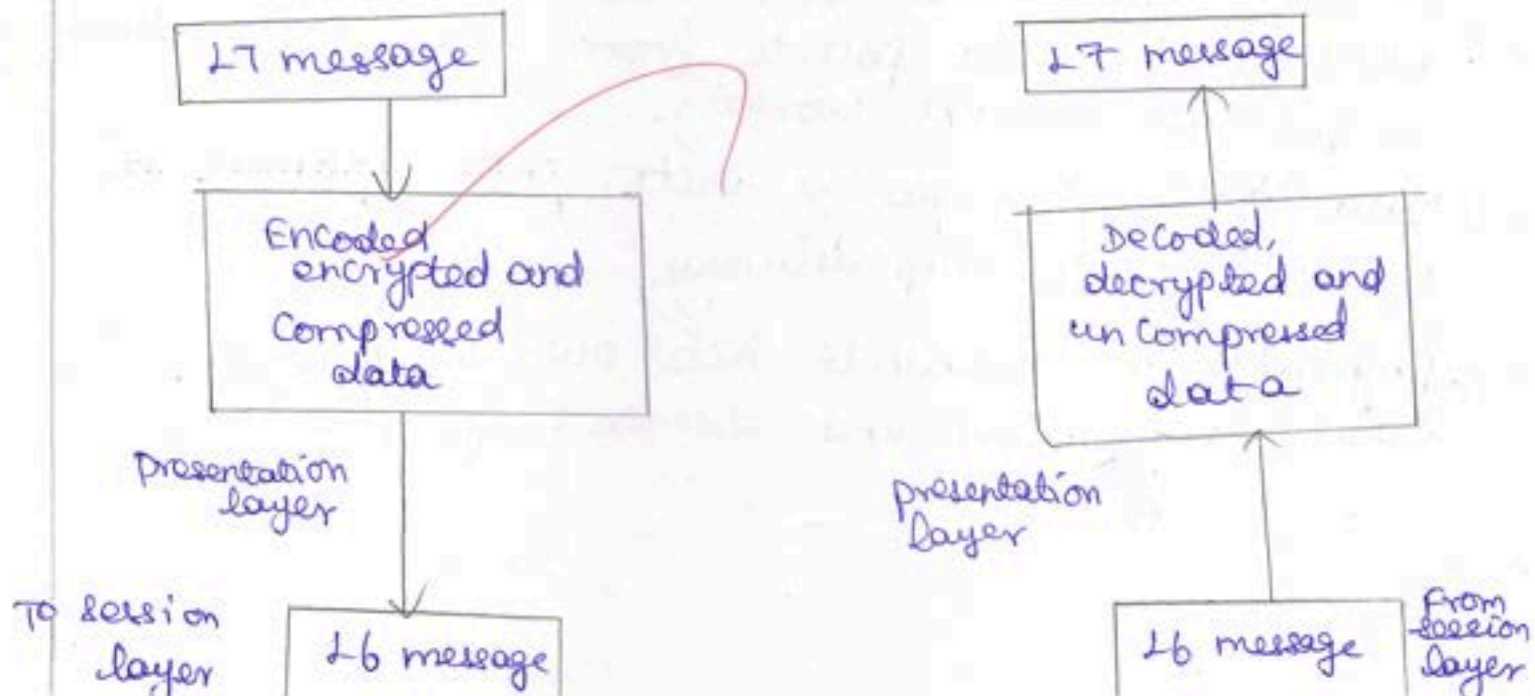
From Network layer.

Session Layer :-

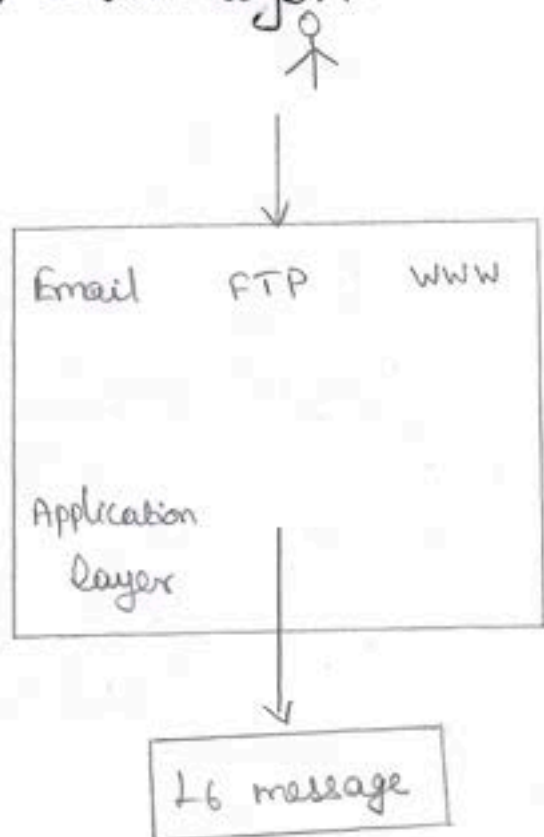


To transport Layer
Session Layer between adjacent nodes.
From transport layer.

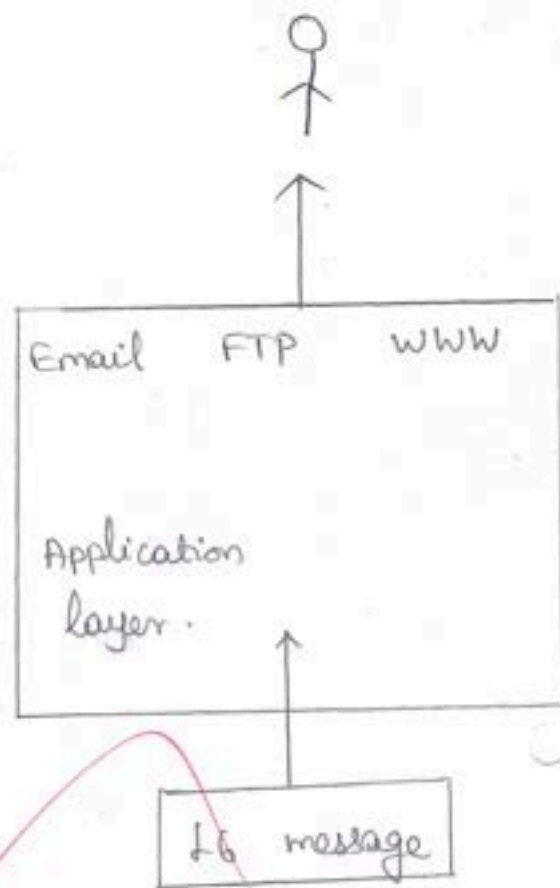
Presentation Layer :-



Application layer:-



To Presentation layer



From presentation layer

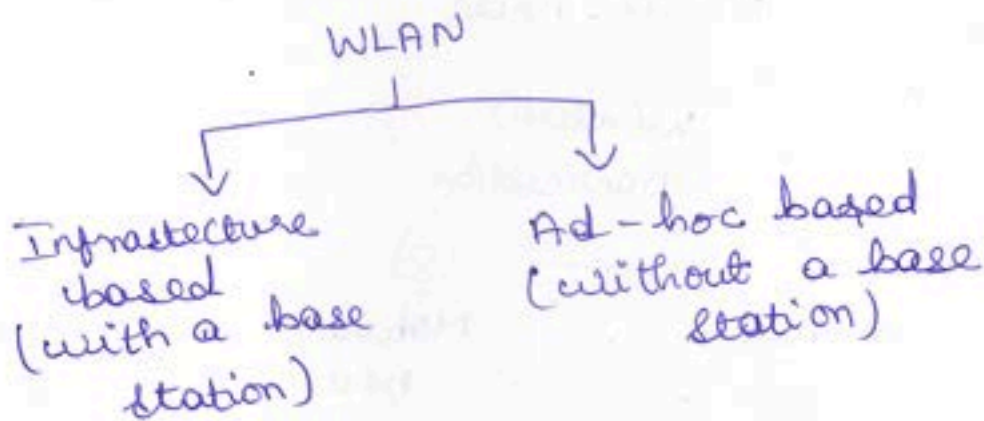
Summary of OSI layer:-

- 1). Applications:- To allow access to network resources.
- 2). Presentation:- To translate, encrypt and Compress data.
- 3). Session:- To establish, manage and terminate sessions.
- 4). Transport:- To provide reliable process-to-process message delivery and error recovery.
- 5). Network:- To move packets from source to destination & provide internet working.
- 6). Data link:- To organize bits into frames; to provide hop-to-hop delivery.
- 7). Physical:- To transmit bits over a medium; to provide mechanical and electrical specifications.

2). Wifi

WLAN Configurations :-

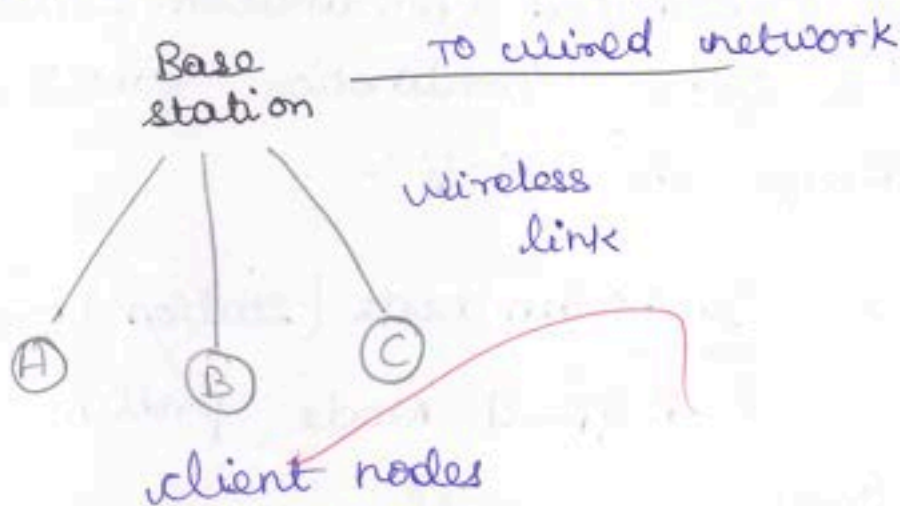
- i). Infrastructure based WLAN, and
- ii). Ad-hoc networking based WLAN.



1). Infrastructure Based WLAN:-

* This common base station model does not permit any direct communication between the client nodes.

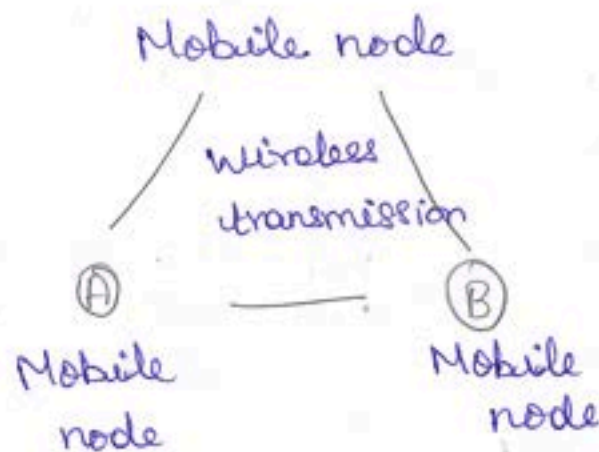
* Communication has to go through only the base station, which is called access point.



* Example:- Cell towers in cellular ^{net} works. A base station is responsible for sending and receiving data.

2). Ad-hoc based WLAN

In an ad-hoc based WLAN Configurations, wireless hosts have no base station and the hosts would just communicate to one another directly.



System Architecture :-

- i). Infrastructure based
- ii). Ad-hoc based

MAC Sublayer :-

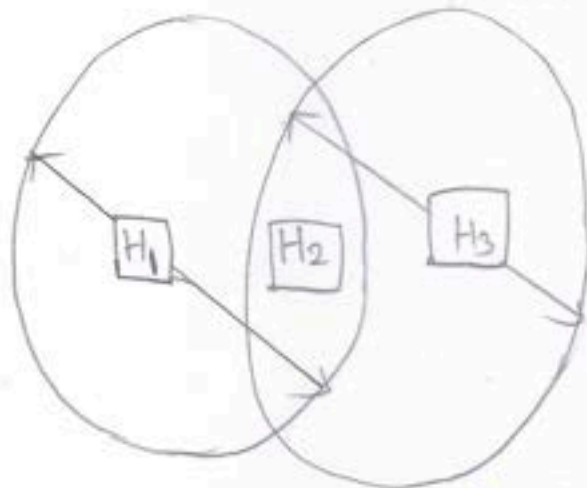
- i). Distributed Coordination function (DCF)
- ii). point Coordination function (PCF)

Problems in Wi-fi :-

- 1). Hidden node (station) problem
- 2). Exposed Node problem.

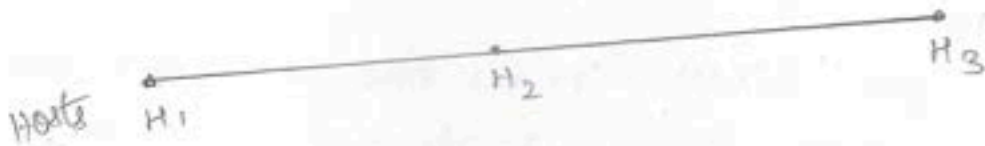
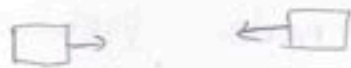
a). Hidden node problem :-

Hidden node problem occurs on a wireless network when two nodes are sending to a common destination but are unaware that the other exists.



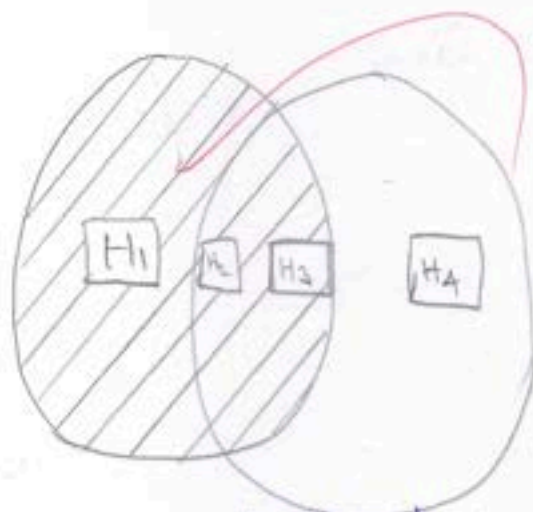
Hosts H_1 and H_3 both are within range of H_2 .

Collision



Hidden node problem

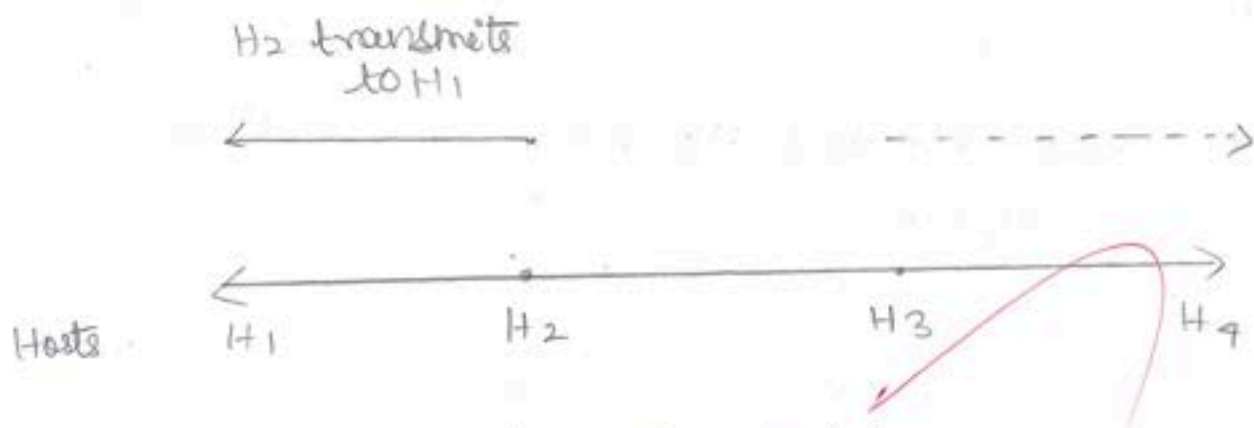
b). Exposed Node problem:-



Hosts H_1 and H_4 both are within range of H_2 & H_3

* This is not a problem since H₃, transmission of H₄ will not interfere with H₁'s receiving signal from H₂.

H₃ wants to send to H₄ but mistakenly sends the transmission will fail.

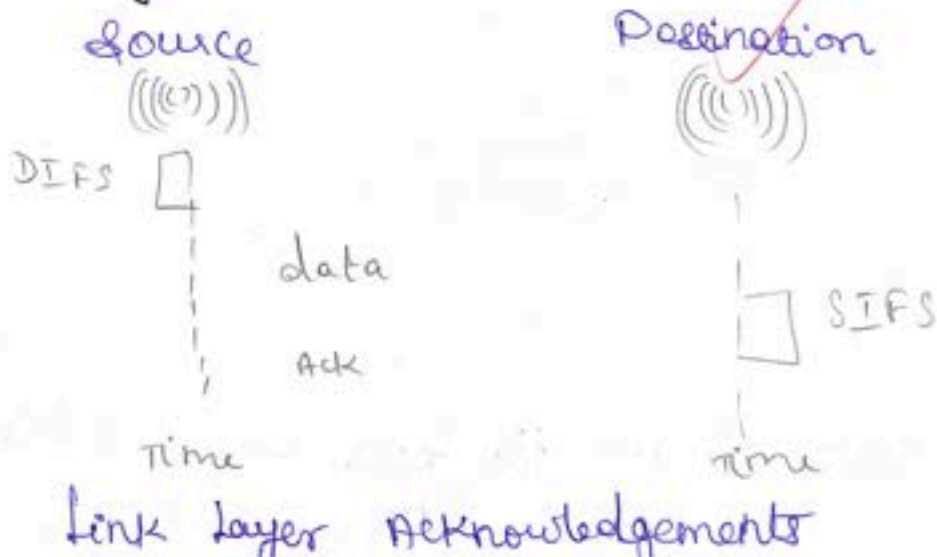


Exposed node problem.

CSMA/CA :-

⊛ DCF uses CSMA/CA as the access method. 802.11 address these problems by using CSMA/CA. In carrier sense part, before sending a packet, the transmitter checks if it can hear any other transmissions; if not it sends.

frame exchange time line :-



NETWORK & SECURITY



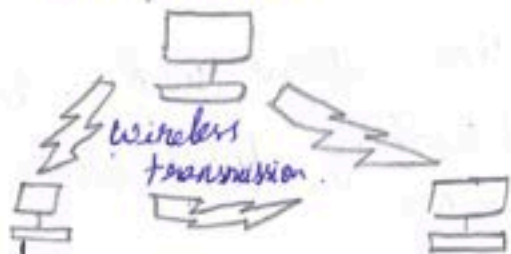
V. MEGANATH

810721106011

ECE IInd Year.

Ad-hoc Based WLAN:

In an ad-hoc WLAN configuration, wireless hosts have no base station and the hosts would just communicate to one another directly. This mode is now sometimes called ad-hoc networking, mobile nodes.



System Architecture.

IEEE 802.11 can exhibit two different basic system architectures are

- i). Infrastructure-based.
- ii). Ad-hoc-based.

Infrastructure Based IEEE 802.11:

It defines two kinds of services: the basic service set (BSS) and the Extended service set (ESS)

Several nodes called stations are called access points (APs), and they are connected to each other. Stations are called distribution method.

Basic service set (BSS):

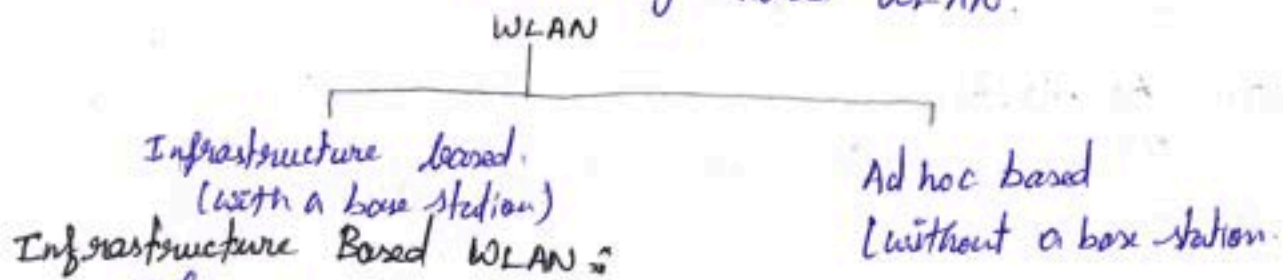
A BSS can be isolated (or) it may connect to the back bone distribution system (DBS) through an access point (AP).

wireless lans :

IEEE 802 Committee formed a new working group named IEEE 802.11, which is specifically devoted to wireless LAN. with a license develop a MAC protocol and physical medium specification.

WLAN Configuration:

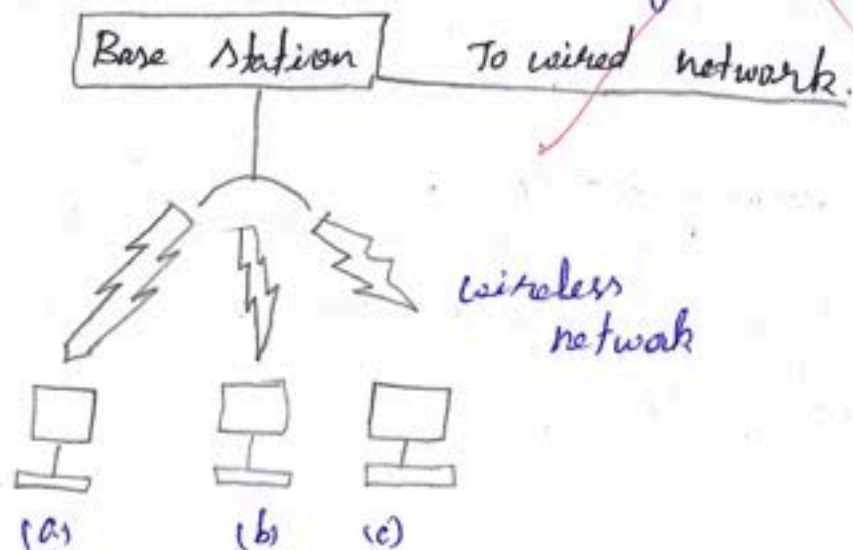
- 1). Infrastructure based WLAN, *
- 2). Ad-hoc networking based WLAN.



Infrastructure Based WLAN:

This common base station model does not permit any direct communication b/w the client nodes.

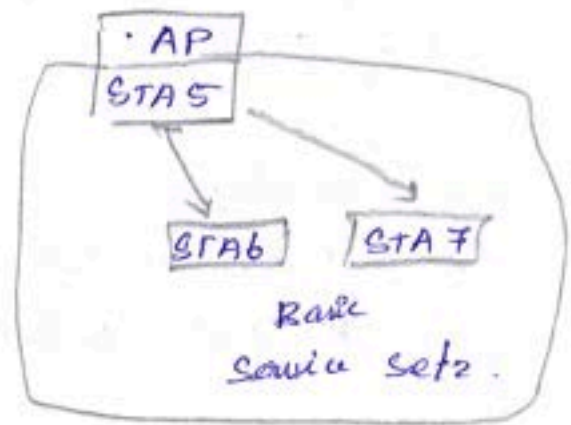
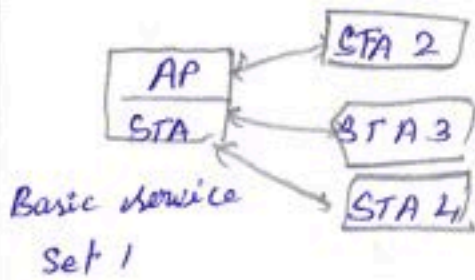
Here, all the communication can go through only the base station, which is called an access point in 802.11 terminology that provides all traditional network services eg: address assignment and routing.



Client nodes.

Extended
Service set

IEEE 802.11
Distribution system



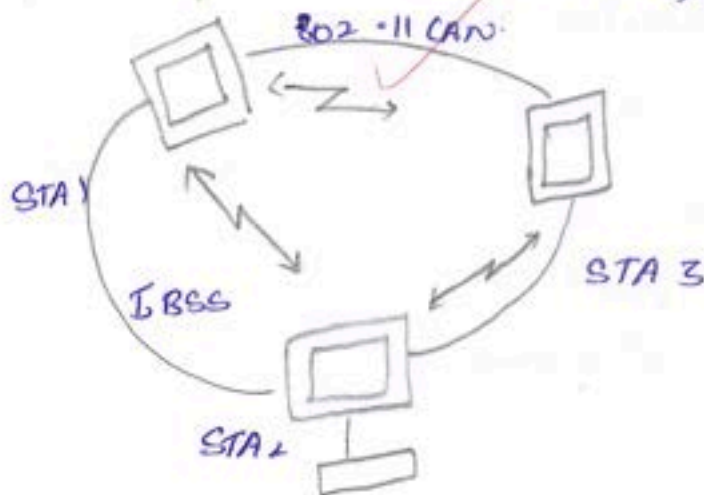
Extended service set (ESS):

An extended service set (ESS) consists of two or more BSS and are interconnected by a distribution system with APs.

The ESS use two types of stations: mobile & stationary
→ the mobile stations are normal stations inside a BSS
→ The stationary stations are AP stations that are part of a wired LAN.

Ad-hoc based IEEE 802.11:

IEEE 802.11 also allows the building of ad-hoc networks b/w stations without AP, thus forming one or more Independent BSS (IBSS).



Station types:

④

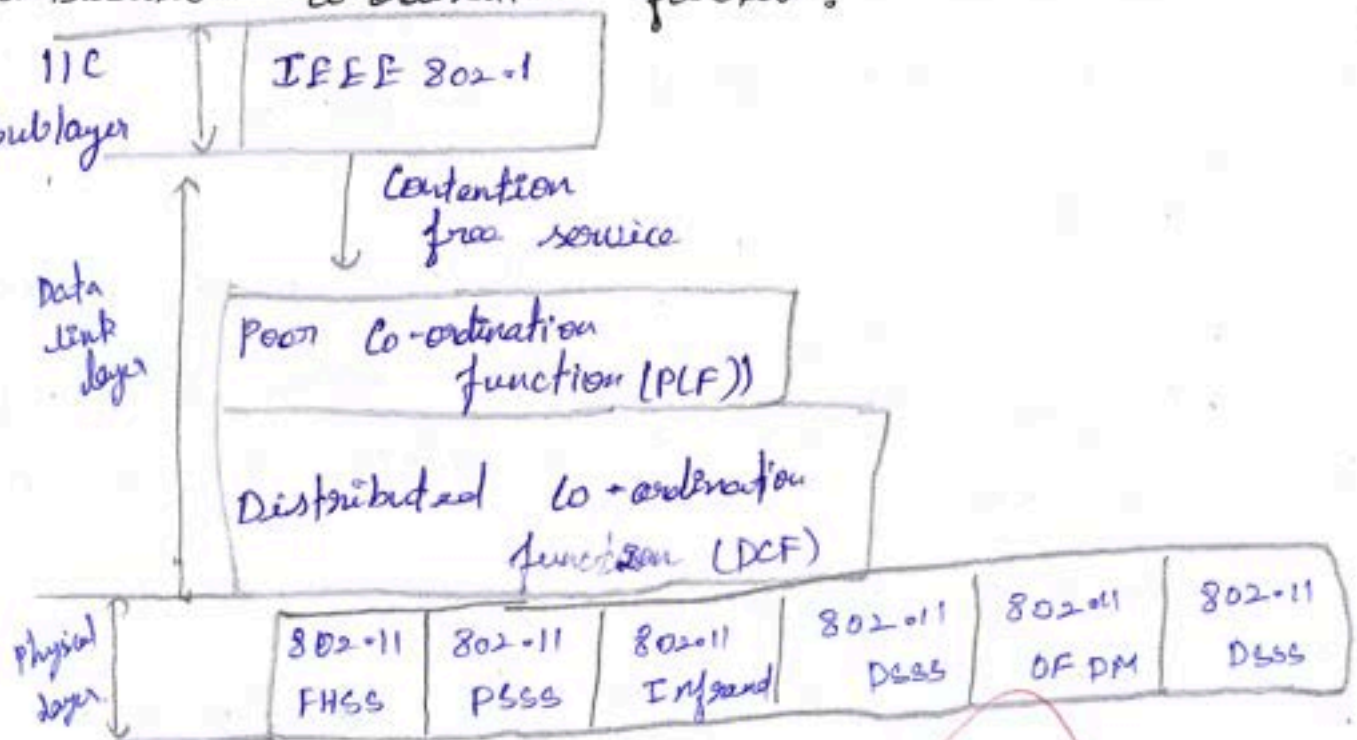
IEEE 802.11 defines 3 types of stations

- 1) NO-transition mobility
- 2) BSS-transition mobility
- 3) ESS-transition mobility.

MAC sublayer

- * Distributed Coordination Function (DCF)
- * Point Coordination Function (PCF)

Distribution Co-ordination function:



IEEE 802.11 Frame format:

The 802.11 standard defines and different classes of frames nearly

- * Data frame
- * Control frame
- * Management frame.

Data frame:

Data frames are used for carrying data and control information.

Management frames:

It is used for the initial communication b/w stations and the access points.

Control frame:

* The control frame is used for accessing the channel and acknowledging the frames.

* For control frame the value of the type field is 01 and the value of the subtype fields for frames.

Subtype	Meaning
1011	Request to send (RTS)
1100	Clear to send (CTS)
1101	Acknowledgement (ACK)

Physical layer (or) IEEE 802.11 standards:

IEEE-802.11 defines a no of different physical layers that operate in various frequency bands and provide a range of different data rates.

Due to high bit-error rates of wireless channels, IEEE 802.11 uses a link layer acknowledgement

Data frame:

Data frames are used for carrying data and control information.

Management frames:

It is used for the initial communication b/w stations and the access points.

Control frame:

* The control frame is used for accessing the channel and acknowledging the frames.

* For control frame the value of the type field is 01 and the value of the subtype fields for frames.

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Physical layer (or) IEEE 802.11 standards:

IEEE-802.11 defines a no of different physical layer that operate in various frequency bands and provide a range of different data rates.

Due to high bit-over rates of wireless channels, IEEE 802.11 uses a link layer acknowledgement

Scheme.

In 1997, original 802.11 standard specifies three transmission techniques allowed in the Physical

→ Infrared

→ Frequency Hopping Spread Spectrum (FH-SS)

Direct Sequence Spread Spectrum (DS-SS)

All the physical layer implementation, except the infrared operate in the industrial, scientific and Medical (ISM) band.

⇒ 902 - 928 MHz

⇒ 2400 - 4.835 GHz

⇒ 5.725 - 5.850 GHz

The advantages of WLAN are as follows.

No restriction for nodes to communicate within its radio coverage.

Ad-hoc networks allows for communication without previous planning.

It provides a very low cost compared to wired networks.

Disadvantages.

Quality of : WLAN generally offer low quality

Security: Less security only provided by WLAN.

OSI LAYER MODEL:

The international standard organization (ISO) is a multinational body dedicated to world wide agreement on international standards. It created a model called the open system Interconnection (OSI), which allows different systems to communicate.

An open system is "a set of protocols that allows any two different systems to communicate regardless of their underlying architecture".

OSI is a model for understanding and designing a network architecture that is flexible, robust and interoperable.

ISO is the organisation, OSI is a model.

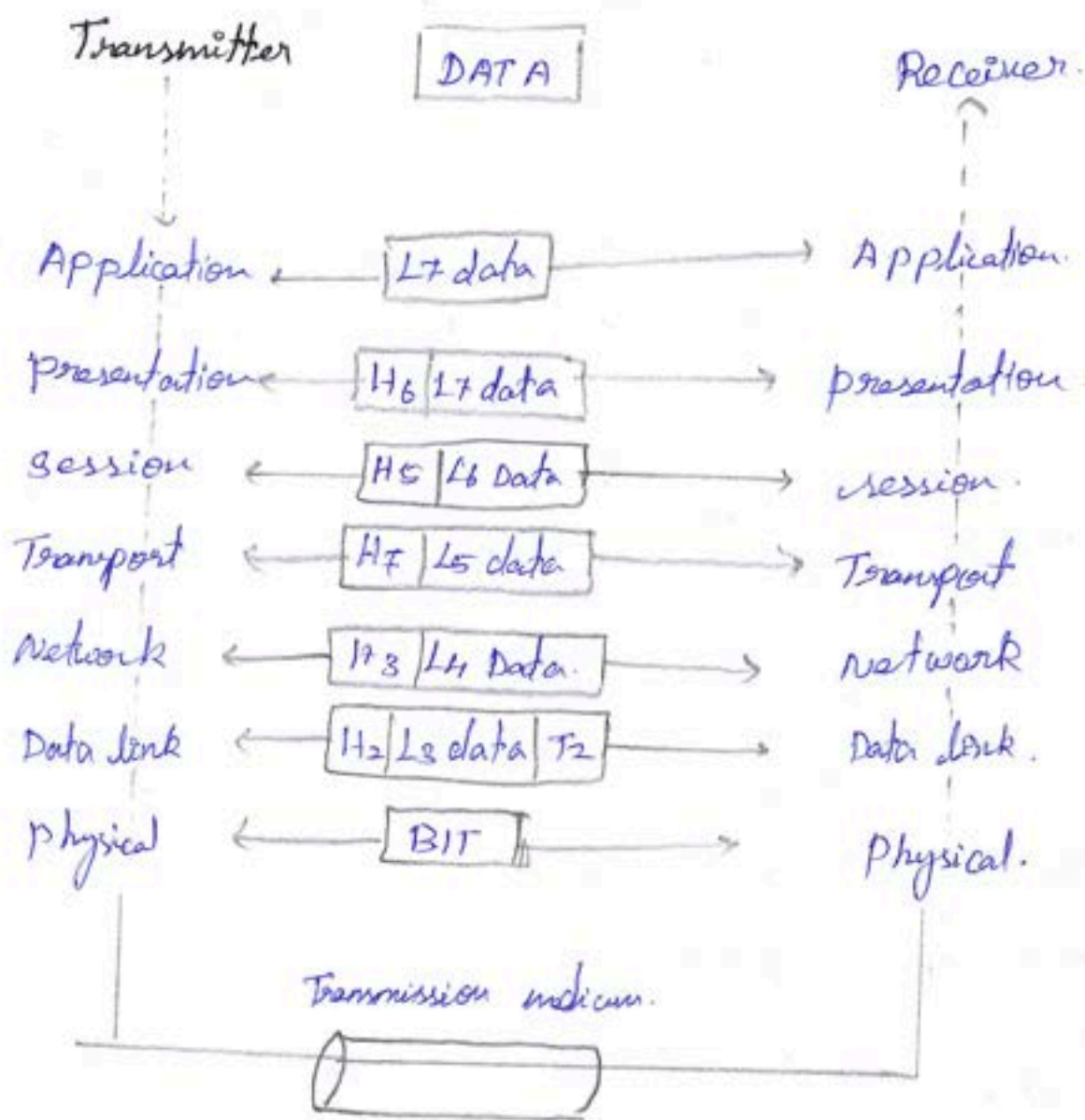
Seven layer of OSI model:

- * Application
- * Presentation
- * Session
- * Transport
- * Network
- * Data link.
- * Physical.

The seven layers are split into three sub groups:

- 1, layers 1, 2, & 3 are the network support layers
- 2, layers 5, 6, & 7 are the user support layers.
- 3, layer 4 is the transport layers, ensures an end to end reliable data transmission while layer 2 ensures reliable transmission on a single link

Layered Architecture:



Functions of OSI Layer:

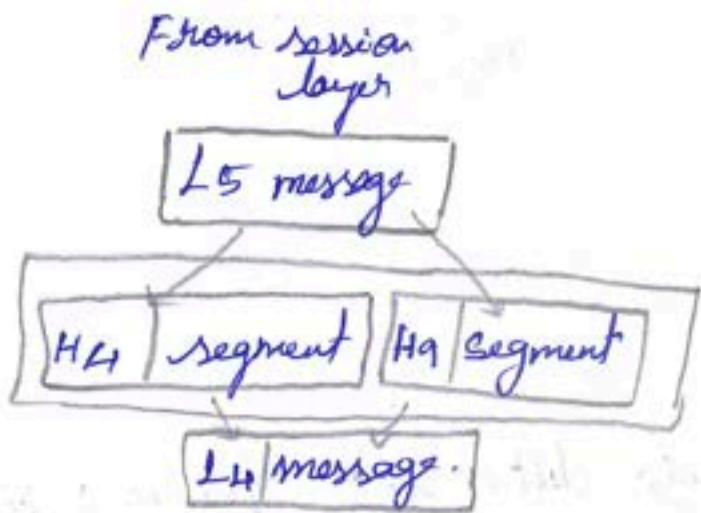
Physical layer:

The physical layer coordinates the functions required to transmit a bit stream, over a physical medium.

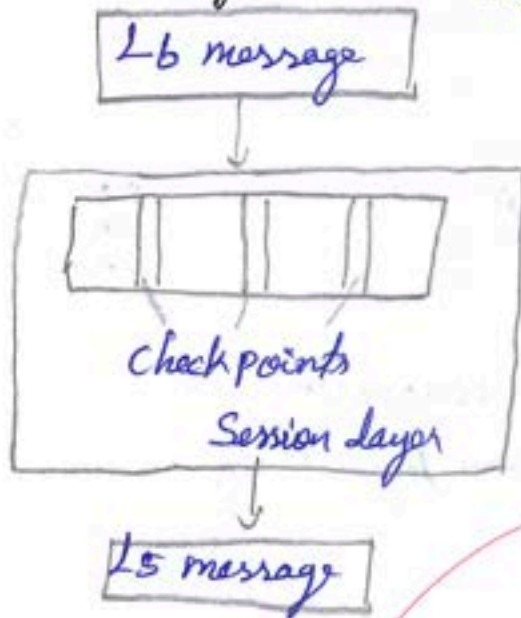
It deals with the mechanical and electrical specifications of the interface & transmission medium.

Transport layer:

To provide reliable process-to-process, message delivery of error recovery.

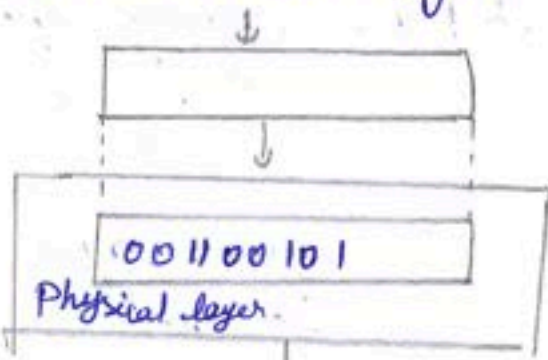


Session layer: To establish, manage & terminate session

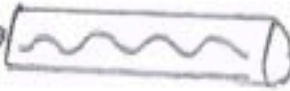
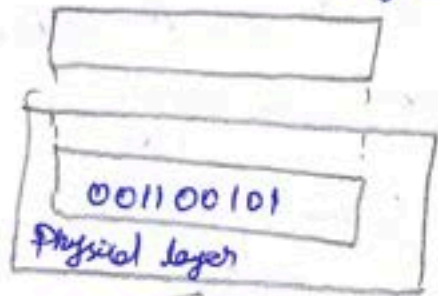


Presentation layer: To translate encrypt & compress data.

From data link layer.



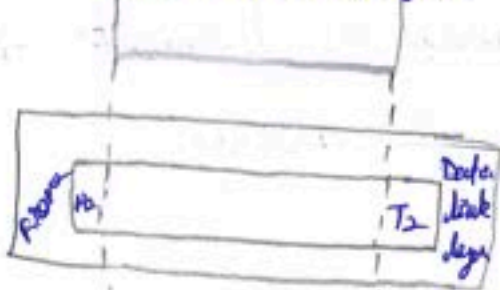
To data link layer



Data link layer:

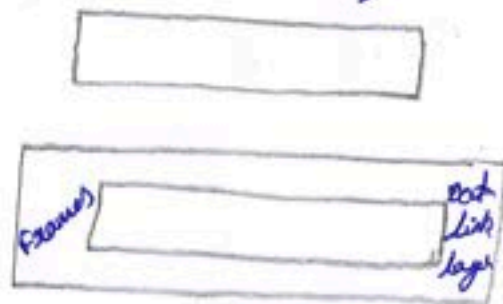
It is used to organize bits into frames: to provide hop to hop delivery.

From network layer.



To Physical layer

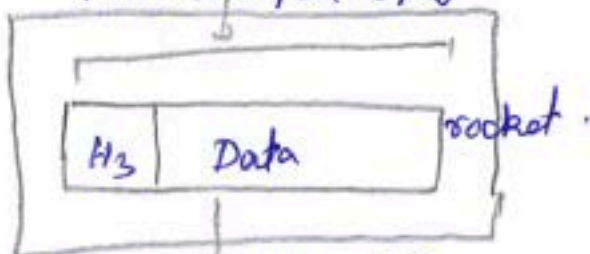
To network layer



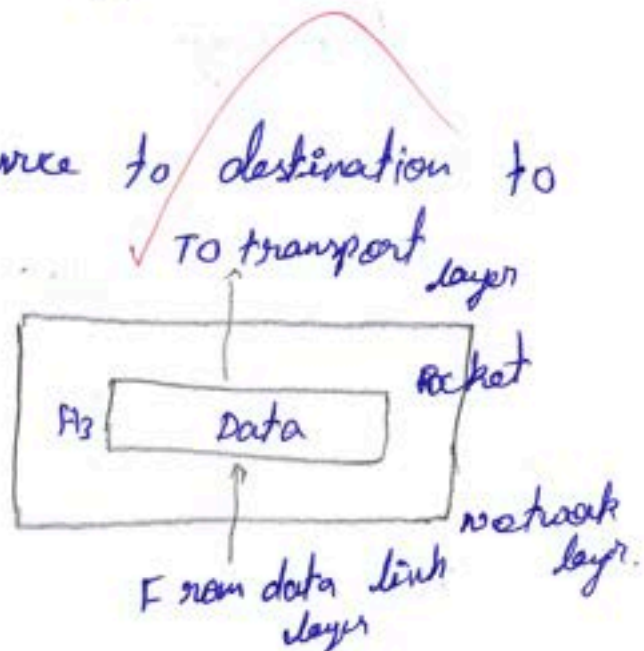
From physical layer.

network layer:

To move packets from source to destination to provide immediately.



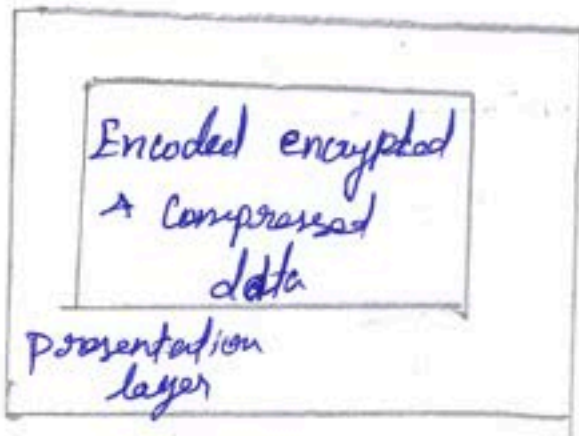
network layer To data link layer



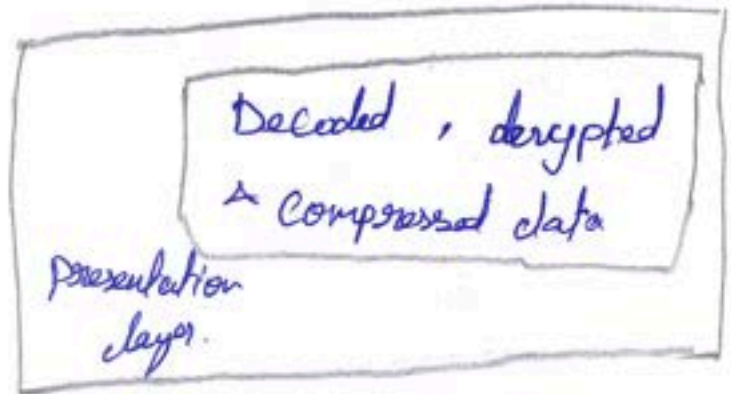
To transport layer

From data link layer network layer

L7 message



L7 message.



L6 message.

To session layer

L6 message

From session layer.

Physical layer:

To allow access to network resources.

Assignment - 1
Networks &
Security.

~~10~~
~~10~~

by:

K. Umamageshwari

II - ECE

810721106025

22/2/23

Assignment - 1.

1. Wi-Fi:

IEEE 802.11 wireless LAN standard, also known as Wi-Fi is designed for use in a limited geographical area and its primary challenge is to mediate access to a shared communication medium when signals propagating through free space.

WLAN Configurations:

Wireless LANs can operate in one of the following two configurations:

- i) Infrastructure Based WLAN
- ii) Ad-hoc networking based WLAN.

i) Infrastructure Based WLAN:

This common base station model does not permit any direct communications between the client nodes.

Ex: Cell towers in cellular networks.

ii) Ad-hoc Based WLAN:

In an ad-hoc based WLAN configuration, wireless hosts have no base station and the hosts would just communicate to one another directly.

IEEE 802.11 System Architecture:

IEEE 802.11 can exhibit two different basic system architectures are,

- i) Infrastructure based, and
- ii) Ad-hoc based.

i) Infrastructure Based IEEE 802.11:

It defines two kinds of services:

- i) Basic service set.
- ii) Extended service set.

a) Basic service Set:

The smallest building block of a wireless LAN is a Basic Service Set which consists of a number of stationary (or) mobile wireless stations that executes the same MAC protocol and an optional central base station known as the access point used to send data to other BSSs.

b) Extended service set (ESS):

An Extended Service Set (ESS) consists of two or more BSSs and are interconnected by a distribution system with APs.

The ESS uses two types of stations:
mobile
stationary.

2) Ad-hoc Based IEEE 802.11:

IEEE 802.11 also allows the building of ad-hoc networks between stations without AP, thus forming one or more independent BSSs.

3) Station types:

i) Non-transition Mobility.

ii) BSS-transition Mobility.

iii) ESS-transition Mobility.

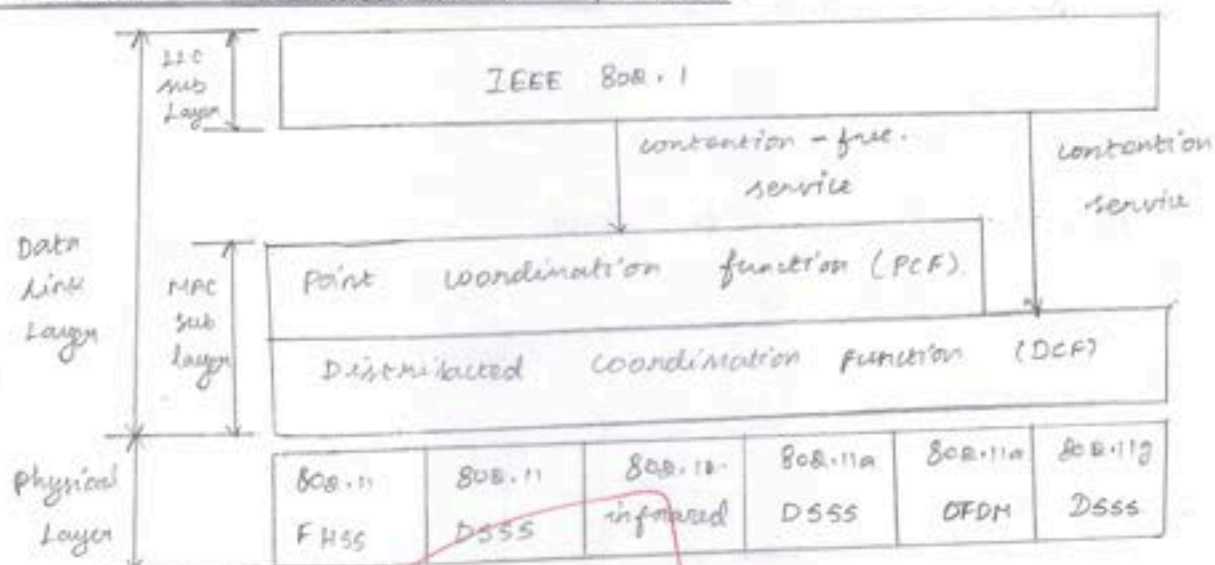
MAC Sublayer:

IEEE 802.11 defines two MAC sublayers.

i) Distributed Coordination Function.

ii) Point Coordination Function.

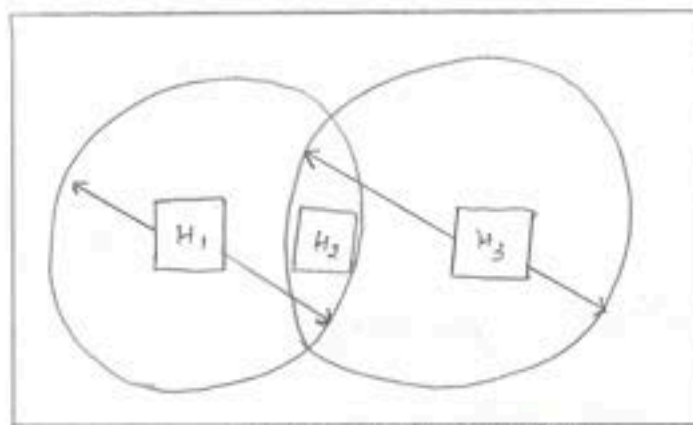
1) Distributed Coordination Function:



All implementations must support DCF but PCF is optional. DCF uses CSMA/CA as the access method.

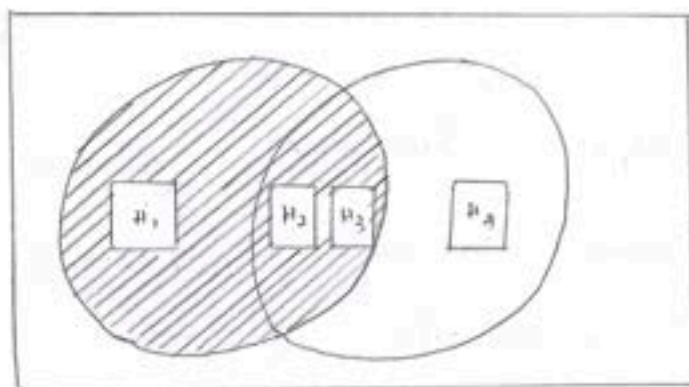
1) Collision Avoidance:

a) Hidden node problem:



Hidden node Problem

b) Exposed node problem:

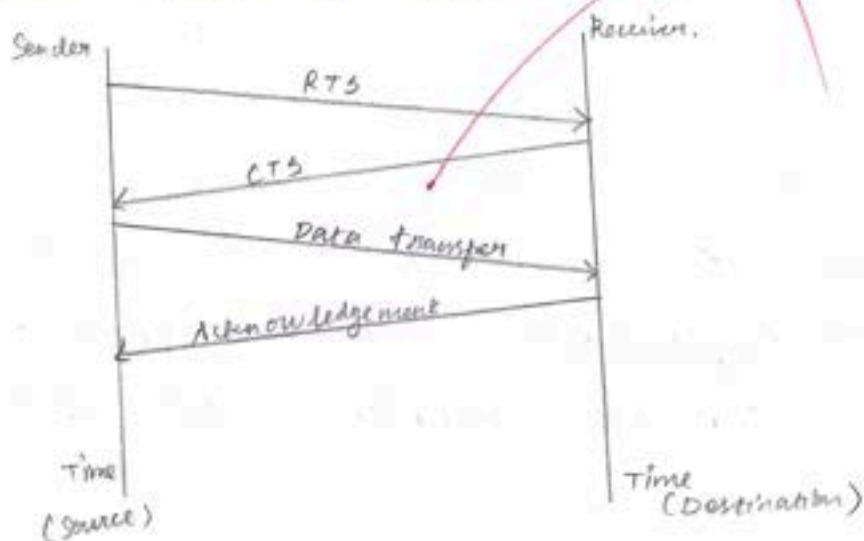


Hosts H_1 and H_4 both are within range of H_2 & H_3

Hand Shaking Signals:

RTS \rightarrow Request to Send

CTS \rightarrow Clear to Send.



Advantages:

i) Flexibility

ii) Planning

Ad-hoc networks allow for communication without previous planning.

iii) Design:

It allows the design of small, independent devices.

iv) Robustness.

It can survive disasters.

v) Cost:

It provides a very low cost compared to wired networks.

Disadvantages:

i) Quality of service

WLAN generally offer low quality.

ii) Restrictions:

iii) security:

Less security only provided by WLAN.

iv) Bit Error Rate:

v) Decreasing signal strength



CARE COLLEGE OF ENGINEERING

(Approved by AICTE and Affiliated to Anna University, Chennai)
27, Thayanur, Trichy - 620009

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

EVEN SEMESTER 2022-2023 TIME TABLE - CYCLE TEST- I (06.03.2023 TO 13.03.2023)

DATE	SESSION	IV YEAR			III YEAR		II YEAR	
06.03.2023	AN 01:45 P.M TO 04.45 P.M	GE8076	PROFESSIONAL ETHICS IN ENGINEERING	EC8652	WIRELESS COMMUNICATION	EC3492	DIGITAL SIGNAL PROCESSING	
07.03.2023	AN 01:45 P.M TO 04.45 P.M	EC8094	SATELLITE COMMUNICATION	EC8691	MICROPROCESSORS AND MICROCONTROLLERS	EC3401	NETWORKS & SECURITY	
08.03.2023	AN 01:45 P.M TO 04.45 P.M	****	*****	EC8095	VLSI DESIGN	EC3452	ELECTROMAGNETIC FIELDS	
09.03.2023	AN 01:45 P.M TO 04.45 P.M	****	*****	EC8651	TRANSMISSION LINES AND RF SYSTEMS	EC3451	LINEAR INTEGRATED CIRCUITS	
11.03.2023	AN 01:45 P.M TO 04.45 P.M	****	*****	MG8591	PRINCIPLES OF MANAGEMENT	EC3491	COMMUNICATION SYSTEMS	
13.03.2023	AN 01:45 P.M TO 04.45 P.M	****	*****	****	*****	GE3451	ENVIRONMENTAL SCIENCES AND SUSTAINABILITY	

EXAM CELL

S. Suban
HEAD

Dept. of Electronics and Communication Engg.
CARE College of Engineering

S. Suban
PRINCIPAL

AB-NIL

Reg Number																			
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CARE COLLEGE OF ENGINEERING, TRICHY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

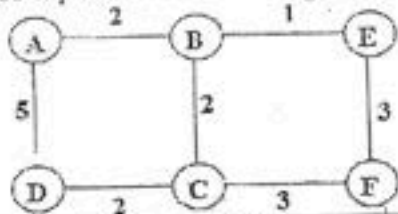
CLASS	:	II B.E ECE	MAX MARKS	:	100
SEMESTER	:	IV	DURATION	:	03 HOURS
SUBJECT	:	NETWORKS & SECURITY	CODE	:	EC3401
COURSE NO.	:	EC402	DATE	:	07.03.2023
ACADEMIC YEAR	:	2022 - 23 (EVEN)	EXAM	:	CYCLE TEST 1

PART - A (10 X 2 = 20 Marks)

I		ANSWER ALL QUESTIONS	BT Level	CO
1		Define Protocol	K1	EC402.1
2		What is meant by Bit stuffing? Give an example	K1	EC402.1
3		Why we go for layering?	K1	EC402.1
4		Define hidden node problem	K1	EC402.1
5		List the drawbacks of Bluetooth.	K1	EC402.1
6		Specify the type of errors handles by the ICMP Messages.	K2	EC402.2
7		Mention the drawbacks of IP.	K1	EC402.2
8		Find the class of each address i) 10001000 01000010 00101000 01001111 ii) 226.27.43.240	K2	EC402.2
9		Write down the advantages of Datagram Approach	K2	EC402.2
10		Compare a Piconet and a Scatternet in the Bluetooth Architecture.	K2	EC402.2

PART - B (5 X 13 = 65 Marks)

II		ANSWER ALL QUESTIONS	Marks	BT Level	CO
11	(a)	Draw OSI Network layer architecture and explain its functionality	13	K2	EC402.1
(OR)					
	(b)	Explain Flow control Mechanism in detail	13	K2	EC402.1
12	(a)	Explain in detail about WLAN Technologies. Explain in detail about Bluetooth architecture with proper diagrams	13	K2	EC402.1
(OR)					
	(b)	Explain in detail about IEEE 802.11 Standard. Also explain how it differs from IEEE 802.3 standard.	13	K2	EC402.1

13	(a)	<p>Answer the following questions:</p> <p>i) What is the polynomial representation of 110111?</p> <p>ii) What is the result of shifting 111000 three bits to the left?</p> <p>iii) Repeat part (ii) using polynomials.</p> <p>iv) What is the result of shifting 110011 four bits to the right?</p> <p>Repeat part (iv) using polynomials.</p>	13	K2	EC402.1		
(OR)							
	(b)	Explain in detail about Error Detection and Correction methods	13	K2	EC402.1		
14	(a)	<p>Explain the function of Distance vector routing protocol for this given figure. Also explain link state routing with proper examples</p> 	13	K2	EC402.2		
(OR)							
	(b)	Discuss the fundamentals and advantages of open shortest path first protocol	13	K2	EC402.2		
15	(a)	With an example network scenario explain the mechanism of Routing Information Protocol and specify the routing table contents.	13	K2	EC402.2		
(OR)							
	(b)	Explain few characteristics of Border gateway protocol proper diagrams	13	K2	EC402.2		
PART - C (1 X 15 = 15 Marks)							
III	ANSWER ALL QUESTIONS				Marks	BT Level	CO
16	(a)	<p>There are two popular technologies for Local Area Network (LAN) design, namely IEEE 802.3 Ethernet and IEEE 802.11 WiFi. Use your knowledge of these technologies to answer the following questions:</p> <p>i) What Data link layer service model is provided by each of these LAN technologies? How are they similar? How are they different? (3)</p> <p>ii) List three similarities about Ethernet and WiFi. (3)</p> <p>iii) Which of these two LAN technologies has the higher bit error rate, and why? (3)</p> <p>iv) Which LAN technology provides better support for mobile users, and how? (3)</p> <p>v) List and explain any two other features of WiFi technology that are not available (or even possible) in Ethernet LANs (3)</p>	15	K2	EC402.1		
(OR)							
	(b)	(i) Explain the Network layer protocols ICMP & Mobile IP with proper diagrams	08	K2	EC402.1		
		(ii) What is IPv4 & IPv6 also compare IPv4 & IPv6.	07	K2	EC402.1		

Blooms Levels: K1 - Remember, K2 - Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 - Create

Faculty In-charge
R.Deepalakshmi AP/ECE

J. Jayarani
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Dr. J. Jayarani

Dr. S. Shanithi
Principal

Reg Number

CARE COLLEGE OF ENGINEERING, TRICHY
DEPARTMENT OF ECE

CLASS:	: II B.E ECE	MAX MARKS	: 100
SEMESTER:	: IV	DURATION	: 03 HOURS
SUBJECT:	: NETWORKS & SECURITY	CODE	: EC3401
COURSE NO	: EC402	DATE	: 07.03.2023
ACADEMIC YEAR	: 2022 - 23 (EVEN)	EXAM	: CYCLE TEST 1

PART - A (10 X 2 = 20 Marks)

ANSWER ALL QUESTIONS		BT level	CO
1.	<p>Define Protocol A network protocol is an established set of rules that determine how data is transmitted between different devices in the same network. Essentially, it allows connected devices to communicate with each other, regardless of any differences in their internal processes, structure or design.</p>	K1	EC402.1
2.	<p>What is meant by Bit stuffing? Give an example Bit stuffing is the mechanism of inserting one or more non-information bits into a message to be transmitted, to break up the message sequence, for synchronization purpose.</p>	K1	EC402.1
3.	<p>Why we go for layering? The layered concept of networking was developed to accommodate changes in technology. Each layer of a specific network model may be responsible for a different function of the network. Each layer will pass information up and down to the next subsequent layer as data is processed.</p>	K1	EC402.1
4.	<p>Define hidden node problem The hidden node problem occurs in the case of wireless communications; namely, when two transmitting terminals simultaneously transmit data to a receiving terminal between them, interference between the two sets of transmitted radio waves occurs, and the receiving terminal becomes unable to receive the data.</p>	K1	EC402.1
5.	<p>List the drawbacks of Bluetooth.</p> <ul style="list-style-type: none"> • They are slower compared to other wireless technology like WI-FI and LAN with optic fibre. • They have a small data range of up to 50 meters. • They still have some security issues while data is transferring. • They have lower bandwidth 	K1	EC402.1
6.	<p>Specify the type of errors handles by the ICMP Messages. ICMP uses the source IP address to send the error message to the source (originator) of the datagram. Five types of errors are handled: destination unreachable, source quench, time exceeded, parameter problems, and redirection</p>	K2	EC402.2
7.	<p>Mention the drawbacks of IP. One of the main disadvantages of using a dedicated IP address is the increased cost. Dedicated IP addresses are typically more expensive than shared IP addresses, as they are not shared among multiple users. This can make them less affordable for small businesses or individual users.</p>	K1	EC402.2
8.	<p>Find the class of each address i) 10001000 01000010 00101000 01001111(Class B)</p>	K2	EC402.2

		ii) 226.27.43.240(Class E)			
9.	Write down the advantages of Datagram Approach The first packet switching network to use the datagrams was CYCLADES. - Datagrams are known by different names at different levels of the OSI model. - For example, at layer 1 we call it Chip, at layer 2 it is called Frame or cell, data packet at layer 3 and data segment at layer 4.			K2	EC402.
10.	Compare a Piconet and a Scatternet in the Bluetooth Architecture. A Piconet is the type of connection that is formed between two or more Bluetooth-enabled devices such as modern cell phones. A Scatternet is a number of interconnected Piconets that supports communication between more than 8 devices.			K2	EC402.1

PART – B (5 X 13 = 65 Marks)

II		ANSWER ALL QUESTIONS			Marks	BT Level	CO
11	(a)	Draw OSI Network layer architecture and explain its Functionality Different types of layers – 05 Marks Functions of Layers with diagram – 05 Marks Explanation – 03 Marks			13	K2	EC402.1
(OR)							
	(b)	Explain Flow Control Mechanism in detail Different types of techniques – 05 Marks Flow diagram – 05 Marks Explanation – 03 Marks			13	K2	EC402.1
12	(a)	Explain in detail about WLAN Technologies. Explain in detail about Bluetooth architecture with proper diagrams Architecture – 05 Marks Flow diagram – 05 Marks Explanation – 03 Marks			13	K2	EC402.1
(OR)							
	(b)	Explain in detail about IEEE 802.11 Standard. Also explain how it differs from IEEE 802.3 standard. Architecture – 05 Marks Flow diagram – 05 Marks Explanation – 03 Marks			13	K2	EC402.1
13	(a)	Answer the following questions: i) What is the polynomial representation of 110111? ii) What is the result of shifting 111000 three bits to the left? iii) Repeat part (ii) using polynomials. iv) What is the result of shifting 110011 four bits to the right? Repeat part (iv) using polynomials.			13	K2	EC402.1

1. Polynomial Representation:

We must ignore the powers of zero and negative.

We have 110111

so it becomes $2x^5 + x^4 + x^2 + x^1 + x^0$

2.3. Bit Shifting

We have 111000, which is 56 in Decimal

3 bits to the left -- 111000000, which is 448 in Decimal

in Poly, 111000 is $2x^5 + x^4 + x^3$

3 bits to the left -- 111000000 is $2x^8 + x^7 + x^6$

4.5. Bit Shifting

We have 110011, which is 51 in Decimal

4 bits to the right -- 11, which is 3 in decimal

in Poly, 110011 is $2x^5 + x^4 + x^1 + x^0$

4 bits to the right -- 11 is $2x^1 + x^0$

(OR)

(b)

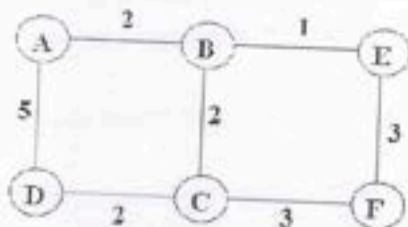
Explain in detail about Error Detection and Correction methods

13

K2

EC402.1

Explain the function of Distance vector routing protocol for this given figure. Also explain link state routing with proper examples



Information stored at node	Distance to Reach node						
	A	B	C	D	E	F	G
A	0	1	1	∞	1	1	∞
B	1	0	1	∞	∞	∞	∞
C	1	1	0	1	∞	∞	∞
D	∞	∞	1	0	∞	∞	1
E	1	∞	∞	∞	0	∞	∞
F	1	∞	∞	∞	∞	0	1
G	∞	∞	∞	1	∞	1	0

(OR)

14

(a)

13

K2

EC402.2

(b)

Discuss the fundamentals and advantages of open shortest path first protocol

i) OSPF definition - 02 Marks

ii) Diagram of routers - 06 Marks

13

K2

EC402.2

			ii) Explanation - 05 Marks			
15	(a)		<p>With an example network scenario explain the mechanism of Routing Information Protocol and specify the routing table contents.</p> <p>i) RIP definition - 02 Marks</p> <p>ii) Diagram of routers - 06 Marks</p> <p>ii) Explanation - 05 Marks</p>	13	K2	EC402.2
(OR)						
	(b)		<p>Explain few characteristics of Border gateway protocol proper diagrams</p> <p>i) Diagram - 06 Marks</p> <p>ii) Functions - 05 Marks</p> <p>iii) Advantages - 02 Marks</p>	13	K2	EC402.2
PART - C (1 X 15 = 15 Marks)						
16	(a)		<p>There are two popular technologies for Local Area Network (LAN) design, namely IEEE 802.3 Ethernet and IEEE 802.11 WiFi. Use your knowledge of these technologies to answer the following questions:</p> <p>i) What Data link layer service model is provided by each of these LAN technologies? How are they similar? How are they different? (3)</p> <p>ii) List three similarities about Ethernet and WiFi. (3)</p> <p>iii) Which of these two LAN technologies has the higher bit error rate, and why? (3)</p> <p>iv) Which LAN technology provides better support for mobile users, and how? (3)</p> <p>v) List and explain any two other features of WiFi technology that are not available (or even possible) in Ethernet LANs (3)</p>	15	K2	EC402.1
(OR)						
	(b)	i)	<p>Explain the Network layer protocols ICMP & Mobile IP with proper diagrams</p> <p>i) Diagram - 03 Marks</p> <p>ii) Functions - 03 Marks</p> <p>iii) Advantages - 02 Marks</p>	08	K2	EC402.1
		ii)	<p>What is IPv4 & IPv6 also compare IPv4 & IPv6.</p> <p>i) Packet format - 04 Marks</p> <p>ii) Explanation - 03 Marks</p>	07	K2	EC402.1

Blooms Levels: K1 - Remember, K2 – Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 – Create

CARE



COLLEGE OF ENGINEERING

Trichy - 620009

INTERNAL ASSESSMENT TEST

Reg. No. : 8 1 0 7 2 1 1 0 6 0 0 7

College Code & Name	807 & CARE COLLEGE OF ENGINEERING		
Student Name	K.A. HANISH		
Degree / Branch	B.E IECE	Semester	IV
Subject Code	EC3401	Date & Session	07.03.2023 & A
Subject Title	NETWORKS & SECURITY	No. of Pages used	16

S. Shanth

Chief Superintendent's Signature / Fescimile

All Particulars given are verified

P. V. N. 12/3/23

P. VANISHA

Name of the Hall Superintendent

Do not write the Register Number, Roll Number, College Code and the Name in any other part of the Answer Book
Put a tick mark (✓) in the applicable Test

UT - I	CT - I	UT - II	CT - II
	✓		

Instruction to the Candidate. Put (✓) for the questions attended in the tick mark column against each question

Q	i				ii				iii				Total Marks	Grand Total				
	✓	C	B	Marks	✓	C	B	Marks	✓	C	B	Marks		CO 1	CO 2	CO 3	CO 4	C
1	✓	0	K1	10	11	✓	0	K2	10									
2	✓	0	K1	14	14	✓	0	K2	13									
3	✓	0	K1	13	13	✓	0	K2	8									
4	✓	0	K1	16	16	✓	0	K2	13									
5	✓	0	K1	12	12	✓	0	K2	2									
6	✓	0	K2															
7	✓	0	K1															
8	✓	0	K2															
9	✓	0	K2															
												46						

50%

Declaration by the Examiner: Verified that all the questions attended by the student are valued and the total is found to be correct

09-03-23	R-DEEPAKSHMI	14/3/23
Date of Valuation	Name of the Examiner	Signature of the Examiner

<p style="color: blue; font-size: 1.2em; font-family: cursive;">Noted</p> <p style="font-size: 0.8em;">Statement of student stating all Comments/ Corrections noted</p>	<p style="text-align: center; color: blue; font-size: 1.2em; font-family: cursive;">m</p> <p style="font-size: 0.8em;">Signature of the Candidate</p>
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PART - A

Q1.

Protocol :

Proto Col.

The protocol means set of rules is called

Q2.

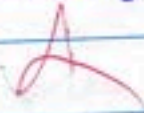
Bit stuffing :

If the number of bits are less than we
stuffing the bit 0 because of no error occurred.
on entered bit

Q3.

layering :

The layering is the set of operations done by hop to hop method that means one by one method. So, we go for layering.



Q4.

Hidden node problem;



Q5. Drawbacks of Bluetooth:

- * less security
- * low distance coverage
- * less frequency transmit

6)

- * Network error
- * internet protocol error.

7. Draw backs of IP:

- * less rules
- * more distractions.

8) P) $10001000 \quad 100010 \quad 00101000 \quad 01001111$
00. 11. 126. 01 - Class D

ii) 226. 27. 43. 240

class D

a)

- * High intensity
- * low speed

10) PIconet & scatternet

PIconet: The piconet has high battery can store

Scatternet: The low latency is created.

PART - B & C

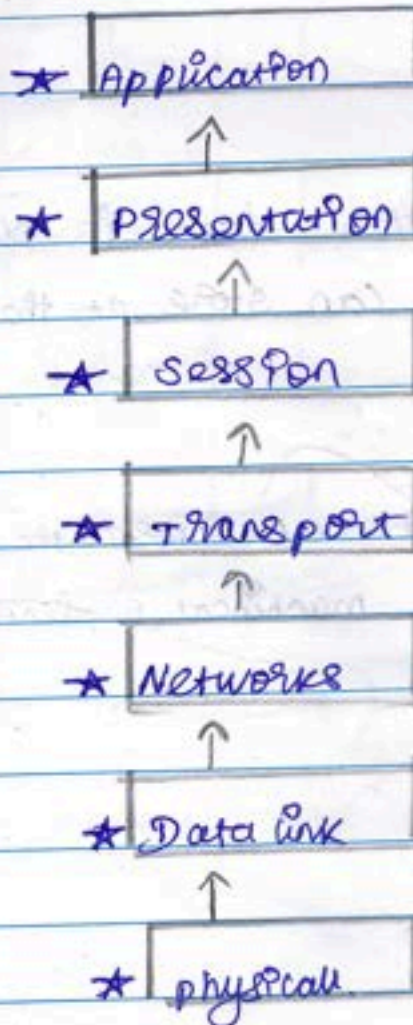
11)

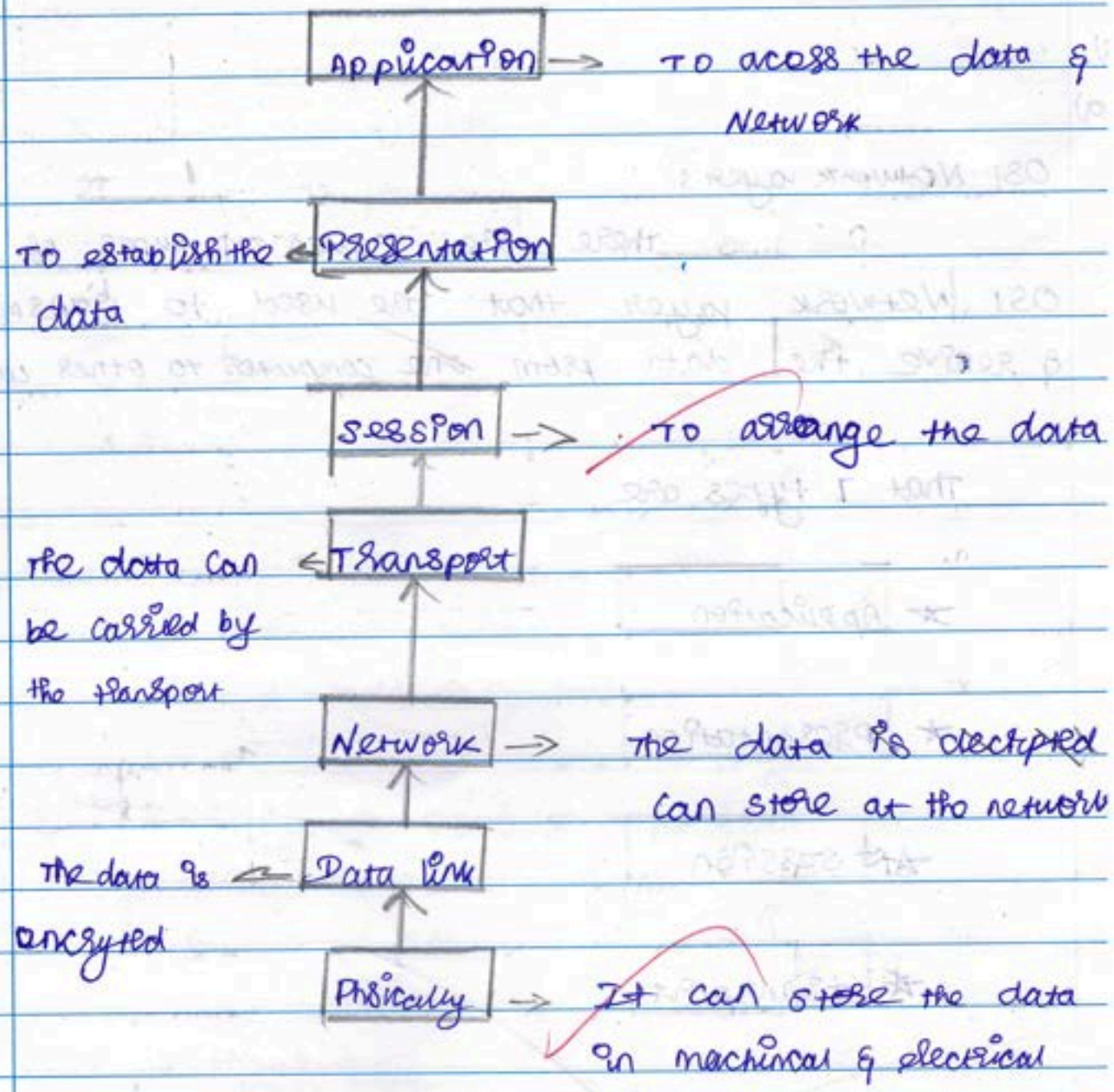
9)

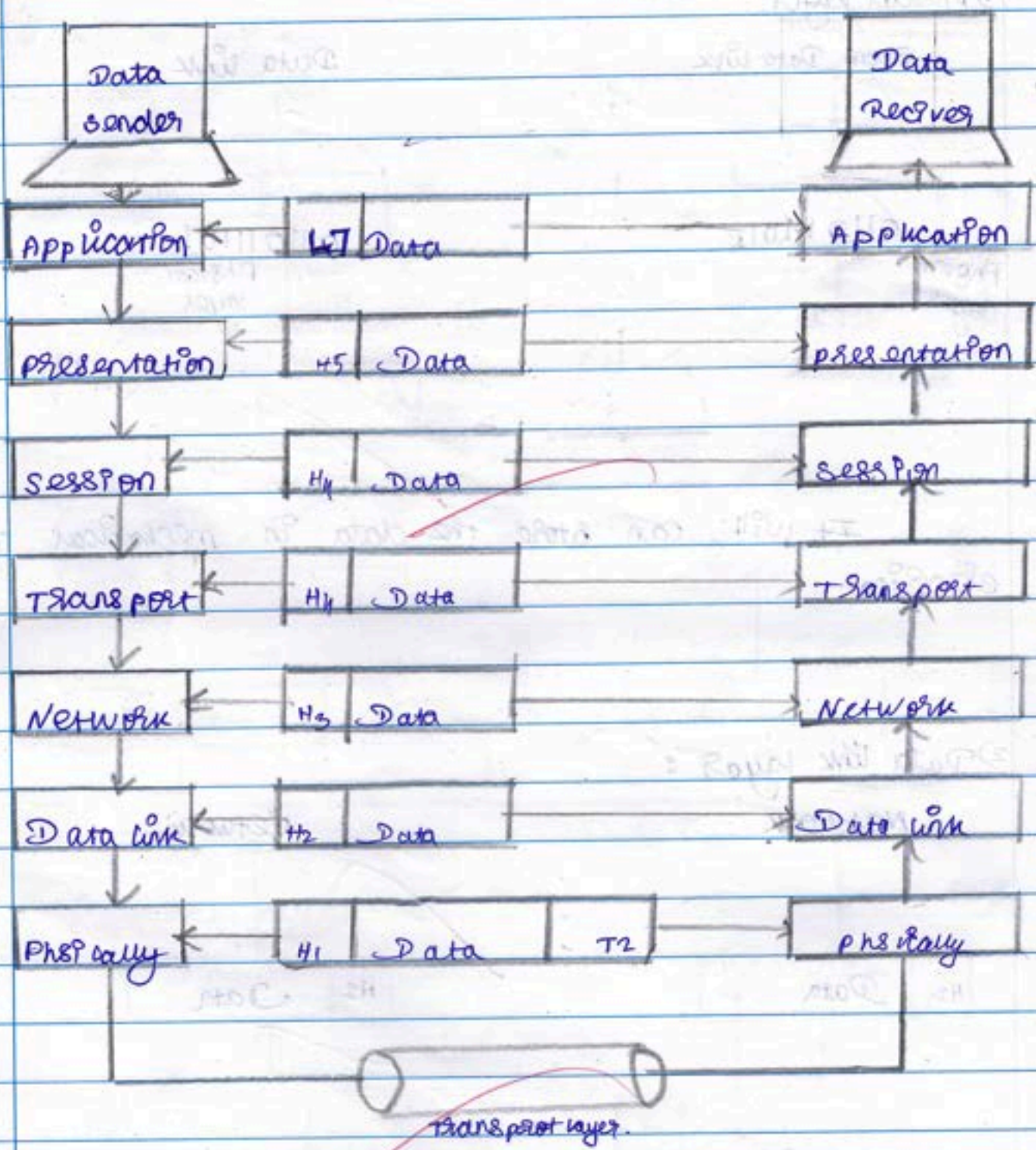
OSI Network layer:

There are seven (7) types of OSI Network layer that are used to transmit & receive the data from one computer to other computer.

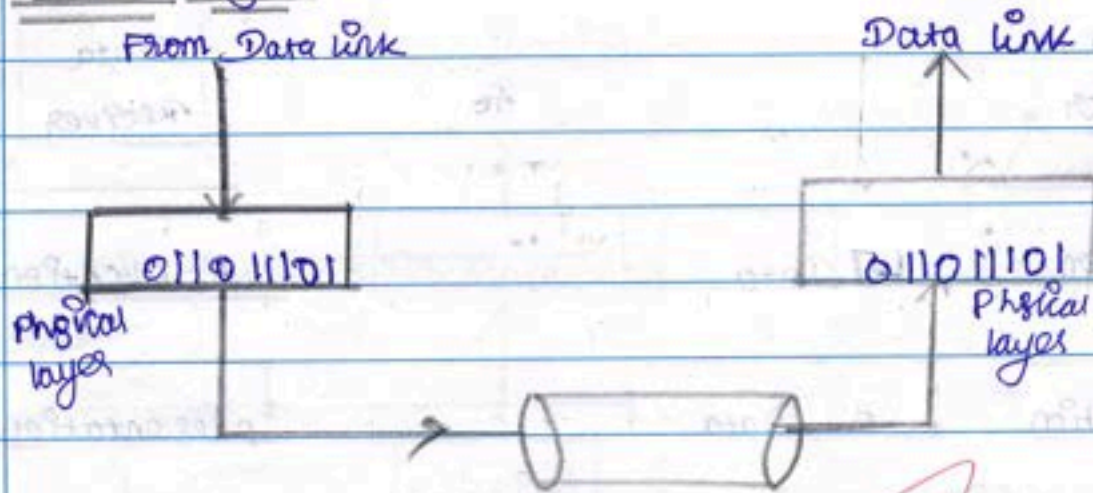
That 7 types are





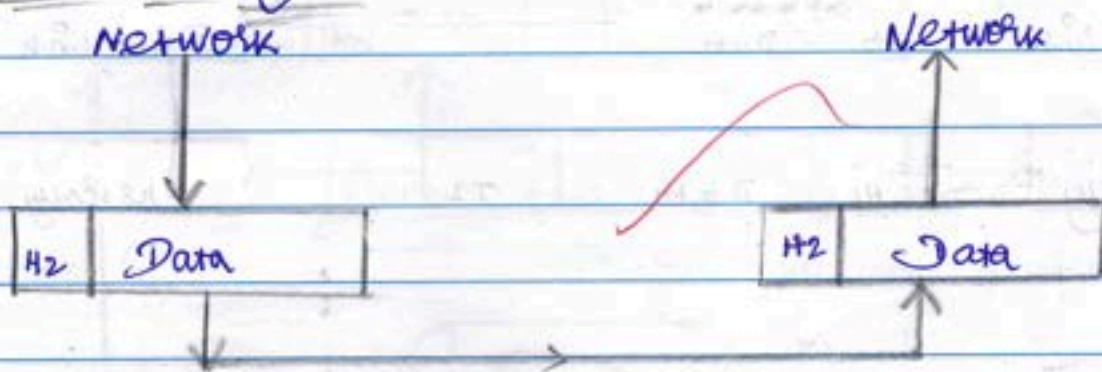


1) Physical layer.



It will can store the data in mechanical to electrical

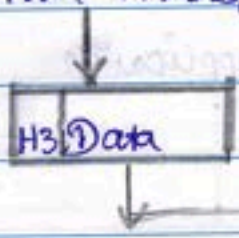
2) Data link layer :



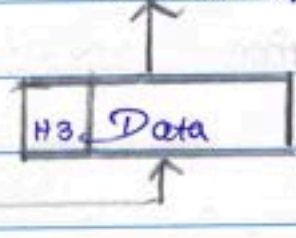
The data is encrypted & send to the sender to receiver.

3) Network layer:

From Transport



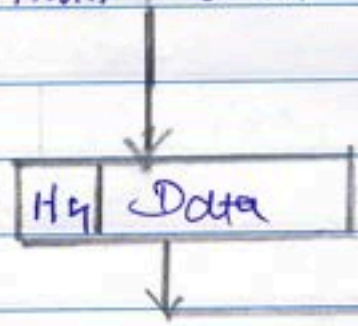
To Transport



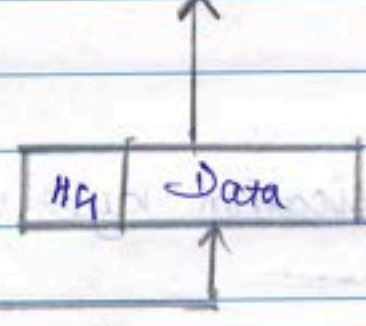
The data is stored in the network layer.

4) Transport layer:

From Session

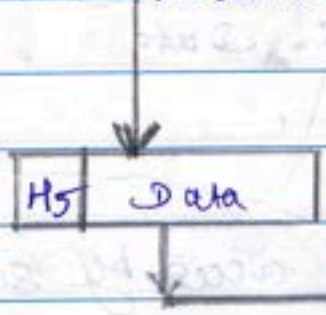


To Session

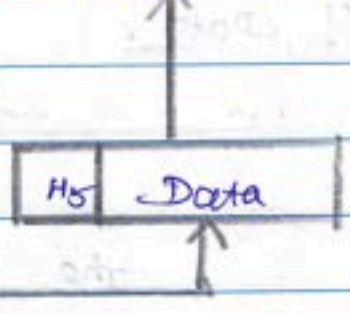


5) Session layer:

From Presentation

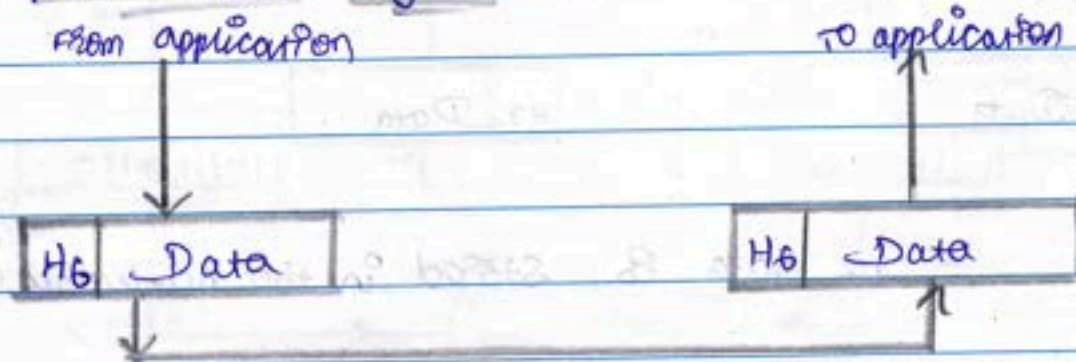


To Presentation



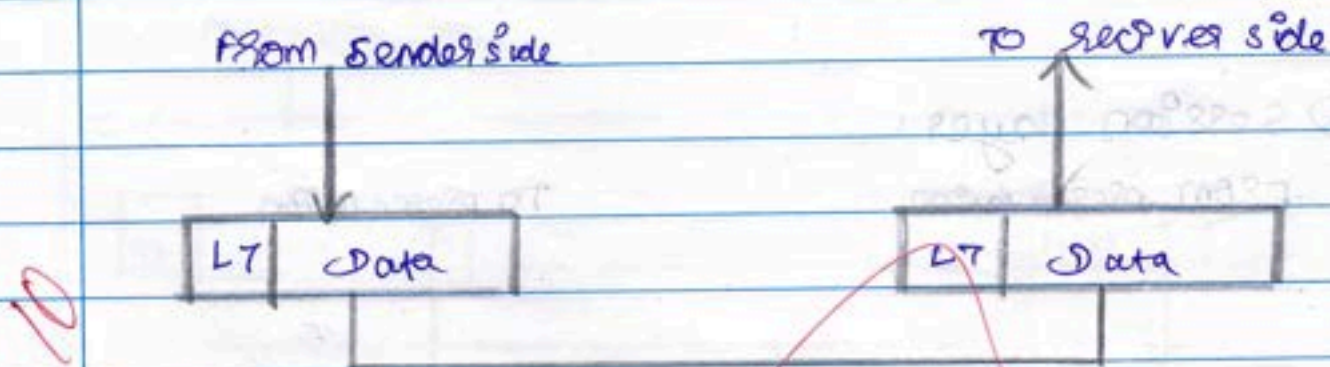
The arrange the data is correct order.

6) presentation layer :



The data can be establish or data can be presented.

1) Application layer :



The data can be access by sender & receiver.

B)

a)

i)

110111

Soln

$$x^5 + x^4 + x^2 + x + 1 = 110111$$

ii) 111000

~~000~~

iii)

$$x^3 \times (x^5 + x^4 + x^2 + x + 1) \neq 0$$

iv)

110011 \rightarrow 11

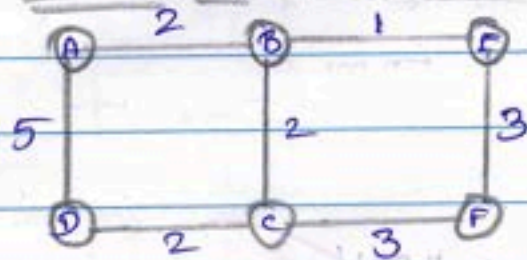
Four bits are removed.

v)

$$x^{-4} \times (x^5 + x^4 + x^2 + x + 1) = xH$$

14)

Distance vector & link state routing.



a)

Dist me	Distance vector					
	A	B	C	D	E	F
A	0	2	∞	5	∞	∞
B	2	0	2	∞	1	∞
C	∞	2	0	2	∞	3
D	5	∞	2	0	∞	∞
E	∞	1	∞	∞	0	3
F	∞	∞	3	∞	3	0

b)

For node A

B	1	1
C	∞	∞
D	5	1
E	∞	∞
F	∞	∞

For node B

A	2	1
C	2	1
D	∞	∞
E	1	1
F	∞	∞

For node C

A	∞	∞
B	2	1
D	2	1
E	∞	∞
F	3	1

For node D

A	5	1
B	∞	∞
C	2	1
E	∞	∞
F	∞	∞

For node E

A	∞	∞
B	1	1
C	∞	∞
D	∞	∞
F	3	1

For node F

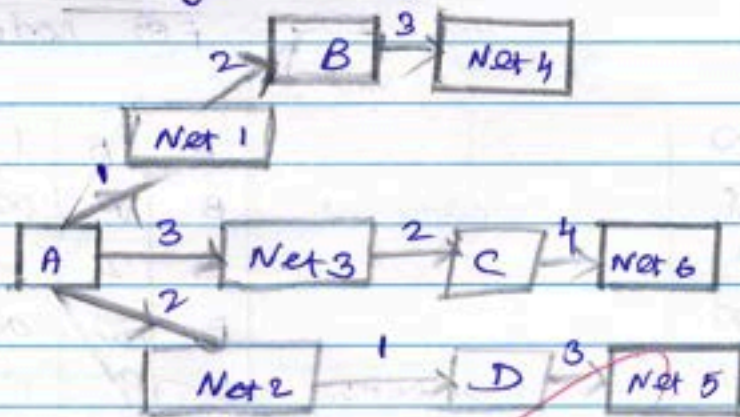
A	∞	∞
B	∞	∞
C	8	1
D	∞	∞
E	3	1

c)

	Distance vector					
Node	A	B	C	D	E	F
A	0	2	4	5	3	6
B	2	0	2	4	1	4
C	4	2	0	2	3	3
D	5	4	2	0	5	5
E	3	1	3	5	0	3
F	6	4	3	5	3	0

To take the least number when adding + not to find path.

IPV6 static routing



A)

Node	Network	Cost	Value
A	1	1	1
B	4	3	2
C	6	4	2
D	5	3	1

Part-C

16)

9)

i)

★ Ethernet is unacknowledge

★ WiFi is acknowledge.

ii)

★ 48-bit MAC address are used

★ RTC protocols are used.

★

iii)

WiFi:

★ the WiFi is used by the wave of air transmit.

★ If there any obstruction (e.g.) any buildings it can't interfere into it.

iv)

WiFi

★ we can easily usable in mobile

★ RTC / CTC protocols are be used in both

v)

★ We can limit the speed of wifi (1, 2, 3, Mbps)

★ Many devices are connected in wifi

★ RTC / CTS protocol are used in both all possible

12) a) Bluetooth :

Application :

★ This are used to mobile & tablet

★ Transfer the data from one to another.

Disadvantage :

★ less safety

★ ~~low~~ ^{low} transmit

★ Not use an long distance.

CARE COLLEGE OF ENGINEERING

Trichy - 620009

INTERNAL ASSESSMENT TEST

Reg. No. : 810721106017

College Code & Name	8107/CARE COLLEGE OF ENGINEERING		
Student Name	SANTHOSH.K		
Degree / Branch	B.E / ECE	Semester	IV th sem.
Subject Code	EC3401	Date & Session	7/3/23 - AN.
Subject Title	NETWORKS & SECURITY	No. of Pages used	11

S. Shanth
Chief Superintendent's Signature / Fescimile

All Particulars given are verified
J.S. Jenin
Name of the Hall Superintendent

Do not write the Register Number, Roll Number, College Code and the Name in any other part of the Answer Book
Put a tick mark (✓) in the applicable Test

UT - I CT - I UT - II CT - II

Instruction to the Candidate. Put (✓) for the questions attended in the tick mark column against each question

Q	i				ii				iii				Total Marks	Grand Total				
	✓	C	B	Marks	✓	C	B	Marks	✓	C	B	Marks		CO 1	CO 2	CO 3	CO 4	CO 5
1	✓	2	1	0	13	✓	2	1	0				6	16	10			
2	✓	2	1	0										6	7	8	9	10
3	✓	2	1	1	14	✓	2	2	4				6					
4	✓	2	1	0														
5	✓	2	1	1	16	✓	2	1	0				10					
6	✓	2	1	4														
Total													20	26%				

Declaration by the Examiner: Verified that all the questions attended by the student are valued and the total is found to be correct

09.03.2023
Date of Valuation

R. DEEPAKSHAMI
Name of the Examiner

R.D. Deepakshami
Signature of the Examiner

Statement of student stating all Comments/ Corrections noted

Santhosh
Signature of the Candidate

RUBRICS FOR ASSIGNMENT CASE STUDY SEMINAR/MINI PROJECTS

1. ASSIGNMENT

Criteria/ Recommended Scores	Excellent 8-10	Very Good 6-8	Good 4-6	Fair 2-4	Satisfactory 0-2
Introduction of the of given topic and significance	In-depth knowledge about the topic	Comprehension of the topic	Adequate knowledge of the topic	Fair knowledge of the topic	Inadequate Knowledge of the topic
Body of the content and flow of content	Main idea is focused and supported with detailed information	Main idea is clear and supported with general information	Main idea is fairly clear and supported with general information	Main idea is fairly clear and supported with limited information	Main idea is not clear and random collection of information
Conclusion, Reference and recent updated & Supportive materials Submission deadline	Strong conclusion exhibiting in-depth knowledge on the subject. Submission on time	Recognizable conclusion with supportive suggestions. Submission on delay	Recognizable conclusion and late submission	Inadequate conclusion and not supported with suggestions and late submission	Absence of conclusion. No originality, Not adhered to deadline

2. SEMINAR

Criteria/ Recommended Scores	Excellent 8-10	Very Good 6-8	Good 4-6	Fair 2-4	Satisfactory 0-2
Presentation Skills 1.Mode of delivery 2.Communication Skill 3.Teaching aid used 4.Time Management	Exemplary communicative skill, multiple teaching aids/ modules complete within given time	Very good communicative skill, usage of board	Moderate communicative skill, use either of the teaching aid (Board/ICT) satisfactory	Fair communicative skill, limited usage of ICT	Poor communicative skill and time management.
Interactive Skills 1.Body language 2.Eye contact 3.Voice	Exemplary body language, eye contact, poised loud voice	Very good body language, eye contact, voice	Moderate time management, language and confidence level, satisfactory eye contact voice	Inadequate time management, fairly maintain eye contact, and less audible voice	Poor body language, rarely maintain eye contact and audible voice
Level of confidence in answering, clearing doubts, Closure of the topic	Summarise and closing remarks capture the attention of audience and set pace with impact	Define summary and closing remarks	Closing remark with good pace and attention of audience	Closing remark with less confidence in clearing doubts	Satisfactory closing remark without proper conclusion

3. CASE STUDY/MINI PROJECTS

Criteria/ Recommended Scores	Excellent 8-10	Very Good 6-8	Good 4-6	Fair 2-4	Satisfactory 0-2
Understanding of the Objective	Excellent understanding of the aim of the case study	Good understanding of the aim of the case study	Average understanding of the aim of the case study	Fair understanding of the aim of the case study	Less understanding of the aim of the case study
Techniques Used	Excellent field application of extension techniques	Very good field application of extension techniques	Good field application of extension techniques	Moderate field application of extension techniques	Less field application of extension techniques
Documentation and Reporting	Excellent documentation of evidences and on time submission of report with high quality	Very good documentation of evidences and on time submission of report with good quality	Good documentation of evidences and on time reporting	Fair documentation of evidences and delay in reporting	Improper documentation of evidences and late reporting

J. Jeyaraj
HEAD
Department of Electronics and Communication
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CARE COLLEGE OF ENGINEERING

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

27, Thayanur, Trichy - 620009

DEPARTMENT OF ECE

AY:: 2022-2023

Year / Semester :II/IV

Sub Code & Name: EC3401 - Networks & Security

S.No	Reg.No	Name of the Student	TOPICS	SEMINAR 20
1	810721106001	ARASU C	Error Detection and Correction	18
2	810721106002	AROCKIYA JAYARAJ S	Ethernet(802.3)	17
3	810721106003	CHARUKESI S	Wireless LAN	18
4	810721106004	DHARUNIKA M	Network Layer Protocols - IP	20
5	810721106005	DIVYADHARSHINI G	Network Layer Protocols - ICMP	20
6	810721106006	ESWARAMOORTHY M	Network Layer Protocols - Mobile IP	20
7	810721106007	HANISH K A	Intradomain Routing Protocols	15
8	810721106008	HELEN PRICILLA X	Interdomain Routing Protocols	19
9	810721106009	KAYAL VIZHI R	IPv4 & IPv6	20
10	810721106010	KOWSIKA S	Transition from IPv4 to IPv6.	18
11	810721106011	MEGANATH V	Transport Layer Protocols - UDP	17
12	810721106012	NOVA AROCKIA RAJ V	Transport Layer Protocols - TCP	20
13	810721106013	REEGAN RUSOUL L	DECbit Algorithm	20
14	810721106014	RIYAZ KHAN S	RED Algorithm	17
15	810721106015	SAKTHIVEL N	QOS in Transport layer	20
16	810721106016	SAMRUTH SRIRAM D	Domain Name System	20
17	810721106017	SANTHOSH K	World Wide Web	18
18	810721106018	SIVAGANAPATHY R	HTTP, Electronic Mail.	20
19	810721106019	SUBHIKSHA S	Application Layer Paradigms	20
20	810721106020	SUDHARSAN R	Client - Server Programming	19
21	810721106021	SUJITHA R	TCP Connection and State Transition Diagram	20
22	810721106022	SURIYAPRABU P	OSI Security Architecture	20
23	810721106024	THARUNIKA M E	Advanced Encryption Standard	20
24	810721106025	UMAMAGESHWARI K	RSA Algorithm	20


R. DEEPA LAKSHMI
AP/ECE


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CARE COLLEGE OF ENGINEERING

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DEPARTMENT OF ECE

AY: 2022-2023

Year / Semester :II/IV

Sub Code & Name: EC3401 - Networks & Security

S.No	Reg.No	Name of the Student	TOPICS	SEMINAR	ASSIGNMENT	INTERNAL MARKS
				20	20	40
1	810721106001	ARASU C	Error Detection and Correction	14	20	34
2	810721106002	AROCKIYA JAYARAJ S	Ethernet(802.3)	14	18	32
3	810721106003	CHARUKESI S	Wireless LAN	10	20	30
4	810721106004	DHARUNIKA M	Network Layer Protocols - IP	19	20	39
5	810721106005	DIVYADHARSHINI G	Network Layer Protocols - ICMP	20	20	40
6	810721106006	ESWARAMOORTHY M	Network Layer Protocols - Mobile IP	11	19	30
7	810721106007	HANISH K A	Intradomain Routing Protocols	10	20	30
8	810721106008	HELEN PRICILLA X	Interdomain Routing Protocols	20	20	40
9	810721106009	KAYAL VIZHI R	IPv4 & IPv6	20	20	40
10	810721106010	KOWSIKA S	Transition from IPv4 to IPv6.	15	19	34
11	810721106011	MEGANATH V	Transport Layer Protocols - UDP	18	20	38
12	810721106012	NOVA AROCKIA RAJ V	Transport Layer Protocols - TCP	18	18	36
13	810721106013	REEGAN RUSOUL L	DECbit Algorithm	17	20	37
14	810721106014	RIYAZ KHAN S	RED Algorithm	12	18	30
15	810721106015	SAKTHIVEL N	QOS in Transport layer	14	20	34
16	810721106016	SAMRUTH SRIRAM D	Domain Name System	20	20	40
17	810721106017	SANTHOSH K	World Wide Web	10	20	30
18	810721106018	SIVAGANAPATHY R	HTTP, Electronic Mail.	15	15	30
19	810721106019	SUBHIKSHA S	Application Layer Paradigms	18	20	38
20	810721106020	SUDHARSAN R	Client - Server Programming	17	20	37
21	810721106021	SUJITHA R	TCP Connection and State Transition Diagram	13	20	33
22	810721106022	SURIYAPRABU P	OSI Security Architecture	12	18	30
23	810721106024	THARUNIKA M E	Advanced Encryption Standard	19	20	39
24	810721106025	UMAMAGESHWARI K	RSA Algorithm	20	20	40


R. DEEPA LAKSHMI
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EC3401 – NETWORKS & SECURITY

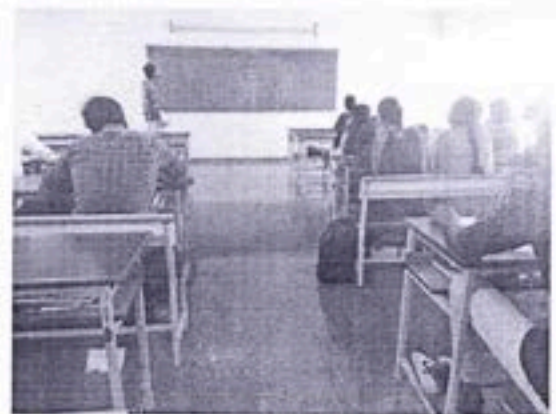
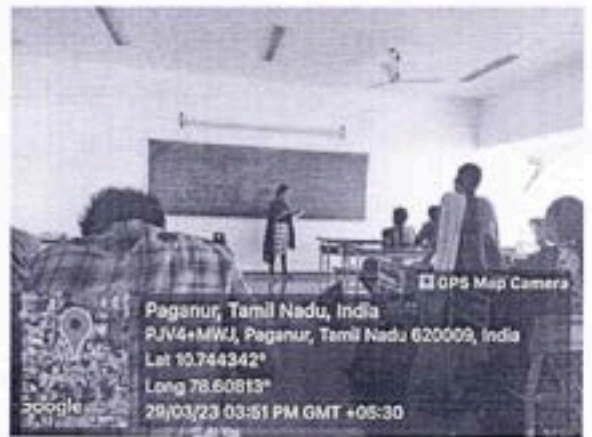
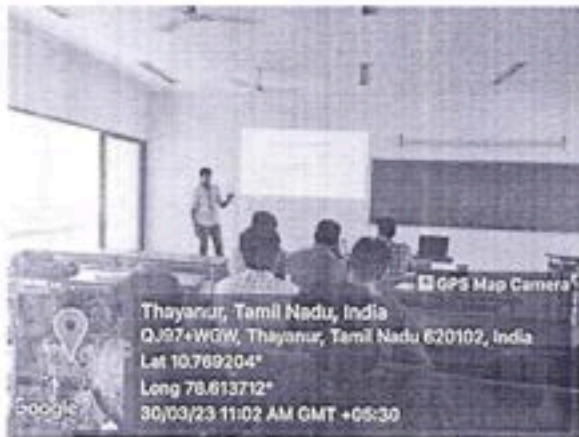
SEMINAR REPORT

Students from II ECE take seminar for the different topics of Networks and Security. They actively participated in the seminar session and explained the topics very clearly and neatly. They explain their topics with real-time case studies and examples, so the listeners also very much interested to learn new topics.

S.No	Reg.No	Name of the Student	TOPICS
1	810721106001	ARASU C	Error Detection and Correction
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24	810721106025	UMAMAGESHWARI K	RSA Algorithm

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Trichy-620 009

Photos of Seminar



J. Jayan

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
EVEN SEMESTER 2022-2023 TIME TABLE - CYCLE TEST - II (05.04.2023 TO 13.04.2023)

DATE	SESSION	IV YEAR			III YEAR		II YEAR	
05.04.2023	AN 01:45 P.M TO 04.45 P.M	GE8076	PROFESSIONAL ETHICS IN ENGINEERING	EC8652	WIRELESS COMMUNICATION	EC3491	COMMUNICATION SYSTEMS	
06.04.2023	AN 01:45 P.M TO 04.45 P.M	EC8094	SATELLITE COMMUNICATION	EC8691	MICROPROCESSORS AND MICROCONTROLLERS	EC3401	NETWORKS & SECURITY	
10.04.2023	AN 01:45 P.M TO 04.45 P.M	****	*****	EC8095	VLSI DESIGN	EC3452	ELECTROMAGNETIC FIELDS	
11.04.2023	AN 01:45 P.M TO 04.45 P.M	****	*****	EC8651	TRANSMISSION LINES AND RF SYSTEMS	EC3451	LINEAR INTEGRATED CIRCUITS	
12.04.2023	AN 01:45 P.M TO 04.45 P.M	****	*****	MG8591	PRINCIPLES OF MANAGEMENT	EC3492	DIGITAL SIGNAL PROCESSING	
13.04.2023	AN 01:45 P.M TO 04.45 P.M	****	*****	****	*****	GE3451	ENVIRONMENTAL SCIENCES AND SUSTAINABILITY	

K. Chandrasekhar
 EXAM CELL

J. Jeyaraj
 HEAD
 Dept of Electronics and Communication Engg.

[Signature]
 PRINCIPAL

Reg Number

CARE COLLEGE OF ENGINEERING, TRICHY
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

CLASS	: II B.E ECE	MAX MARKS	: 100
SEMESTER	: IV	DURATION	: 03 HOURS
SUBJECT	: NETWORKS & SECURITY	CODE	: EC3401
COURSE NO.	: EC402	DATE	: 06.04.2023
ACADEMIC YEAR	: 2022 - 23 (EVEN)	EXAM	: CYCLE TEST-II

PART - A (10 X 2 = 20 Marks)

I		ANSWER ALL QUESTIONS	BT Level	CO
1		Differentiate UDP and TCP	K1	EC402.3
2		What is congestion and Congestion control?	K1	EC402.3
3		Write approaches use to support QOS	K1	EC402.3
4		Give the comparison between leaky bucket and token bucket algorithms.	K1	EC402.3
5		What do you mean RTT?	K1	EC402.3
6		Define POP3 and IMAP4.	K1	EC402.3
7		Name the different types of Security Attacks.	K1	EC402.4
8		What do you mean by encipherment?	K1	EC402.4
9		What are the applications of SHA?	K1	EC402.4
10		Define Digital Signature.	K1	EC402.4

PART - B (5 X 13 = 65 Marks)

II		ANSWER ALL QUESTIONS	Marks	BT Level	CO
11	(a)	Explain in detail about UDP services and what are the advantages of UDP.	13	K2	EC402.3
(OR)					
	(b)	Explain in detail about TCP services and also explain the advantages of TCP over UDP	13	K2	EC402.3
12	(a)	Explain in detail about TCP Connection establishment and termination using three-way handshake using neat diagrams. Also with neat sketch, explain in detail the events and transitions about the TCP State-Transition-Diagrams(STD)	13	K2	EC402.3
(OR)					
	(b)	Explain in detail about TCP congestion Avoidance Techniques. Also explain DECbit and RED algorithm for Congestion Avoidance	13	K2	EC402.3

13	(a)	Describe the token bucket mechanism for congestion control. With which other technique is token bucket usually combined to achieve complete flow control? What problems in the simpler approach are addressed by using a token bucket mechanism?	13	K2	EC402.3		
(OR)							
	(b)	Explain in detail about DNS and HTTP of Application layer Protocols	13	K2	EC402.3		
14	(a)	Explain in detail about OSI Security Architecture.	13	K2	EC402.4		
(OR)							
	(b)	Explain in detail about AES Structure with neat sketches.	13	K2	EC402.4		
15	(a)	Discuss in detail about RSA Algorithm.	13	K2	EC402.4		
(OR)							
	(b)	Explain in detail about Public Key Crypto Systems	13	K2	EC402.4		
PART - C (1 X 15 = 15 Marks)							
III	ANSWER ALL QUESTIONS				Marks	BT Level	CO
16	(a)	Suppose TCP operates over a 1-Gbps link, utilizing the full bandwidth continuously. How long will it take for these sequence numbers to wrap around completely? Suppose an added 32-bit timestamp field increments 1000 times during this wrap around time, how long will it take for the timestamp field to wrap around?	15	K3	EC402.3		
(OR)							
	(b)	Explain the techniques to improve QoS in Transport layer protocols	15	K3	EC402.3		

Blooms Levels: K1 - Remember, K2 - Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 - Create

~~Faculty In-charge~~
R. Deepalakshmi AP/ECE

J. Jeyarani
HOD
Dr. J. Jeyarani

S. Shanthi
Principal
Dr. S. Shanthi

Reg Number

CARE COLLEGE OF ENGINEERING, TRICHY
DEPARTMENT OF ECE

CLASS:	: II B.E ECE	MAX MARKS	: 100
SEMESTER:	: IV	DURATION	: 03 HOURS
SUBJECT:	: NETWORKS & SECURITY	CODE	: EC3401
COURSE NO	: EC402	DATE	: 06.04.2023
ACADEMIC YEAR	: 2022 – 23 (EVEN)	EXAM	: CYCLE TEST II

PART – A (10 X 2 = 20 Marks)

ANSWER ALL QUESTIONS				BT level	CO																				
I.	1.	Differentiate UDP and TCP	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Sr. No.</th> <th style="text-align: center;">Key</th> <th style="text-align: center;">TCP (Transmission Control Protocol)</th> <th style="text-align: center;">UDP (User Datagram Protocol)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">Definition</td> <td>It is a communications protocol, using which the data is transmitted between systems over the network. In this, the data is transmitted into the form of packets. It includes error-checking, guarantees the delivery and preserves the order of the data packets.</td> <td>It is same as the TCP protocol except this doesn't guarantee the error-checking and data recovery. If you use this protocol, the data will be sent continuously, irrespective of the issues in the receiving end.</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">Design</td> <td>TCP is a connection oriented protocol.</td> <td>UDP is a connection less protocol.</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">Reliable</td> <td>As TCP provides error checking support and also guarantees delivery of data to the destination router this make it more reliable as compared to UDP.</td> <td>While on other hand UDP does provided only basic error checking support using checksum so the delivery of data to the destination cannot be guaranteed in UDP as compared to that in case of TCP.</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">Data transmission</td> <td>In TCP the data is transmitted in a particular sequence which means</td> <td>On other hand there is no sequencing of data in UDP in order to implement</td> </tr> </tbody> </table>	Sr. No.	Key	TCP (Transmission Control Protocol)	UDP (User Datagram Protocol)	1	Definition	It is a communications protocol, using which the data is transmitted between systems over the network. In this, the data is transmitted into the form of packets. It includes error-checking, guarantees the delivery and preserves the order of the data packets.	It is same as the TCP protocol except this doesn't guarantee the error-checking and data recovery. If you use this protocol, the data will be sent continuously, irrespective of the issues in the receiving end.	2	Design	TCP is a connection oriented protocol.	UDP is a connection less protocol.	3	Reliable	As TCP provides error checking support and also guarantees delivery of data to the destination router this make it more reliable as compared to UDP.	While on other hand UDP does provided only basic error checking support using checksum so the delivery of data to the destination cannot be guaranteed in UDP as compared to that in case of TCP.	4	Data transmission	In TCP the data is transmitted in a particular sequence which means	On other hand there is no sequencing of data in UDP in order to implement	K1	EC402.3
Sr. No.	Key	TCP (Transmission Control Protocol)	UDP (User Datagram Protocol)																						
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4	Data transmission	In TCP the data is transmitted in a particular sequence which means	On other hand there is no sequencing of data in UDP in order to implement																						
	2.	<p>What is congestion and Congestion control?</p> <p>Closed loop congestion control technique is used to treat or alleviate congestion after it happens. Several techniques are used by different protocols; some of them are: Backpressure : Backpressure is a technique in which a congested node stop receiving packet from upstream node.</p> <p>Congestion control is a method used for monitoring the process of regulating the total amount of data entering the network so as to keep traffic levels at an acceptable value.</p>	K1	EC402.3																					
	3.	<p>Write approaches use to support QoS</p> <p>There are two principal approaches to QoS in modern packet-switched IP networks, a parameterized system based on an exchange of application requirements with the network, and a prioritized system where each packet identifies a desired service level to the network.</p>	K1	EC402.3																					
	4.	Give the comparison between leaky bucket and token bucket algorithms.	K1	EC402.3																					

	Leaky Bucket Algorithm	Token Bucket Algorithm		
	<p>The packets are thrown into the bucket.</p> <p>The bucket leaks at a constant rate.</p> <p>If a packet comes at a finite rate.</p> <p>It converts bursty traffic into uniform traffic.</p>	<p>It holds packets generated at regular intervals of time.</p> <p>It has a maximum capacity.</p> <p>The packet cannot be sent if there are no tokens in the bucket.</p> <p>When there is a ready packet, a token is removed and the packet is sent.</p>		
5.	<p>What do you mean RTT?</p> <p>Round-trip time (RTT) is the duration in milliseconds (ms) it takes for a network request to go from a starting point to a destination and back again to the starting point</p>		K1	EC402.3
6.	<p>Define POP3 and IMAP4.</p> <p>POP3 downloads emails from a server to a single computer, making those emails only accessible on that specific computer. IMAP stores emails on a server and then syncs them across multiple devices. IMAP is more advanced than POP3 and allows you to access your email from anywhere, and on any device.</p>		K1	EC402.3
7.	<p>Name the different types of Security Attacks.</p> <p>Malware-based attacks.</p> <ul style="list-style-type: none"> • Phishing attacks. • Man-in-the-middle attacks. • Denial of Service attacks. • SQL injection attacks. • DNS tunneling. • Zero-day exploits. • Password attacks. 		K1	EC402.4
8.	<p>What do you mean by encipherment?</p> <p>Encryption is the method by which information is converted into secret code that hides the information's true meaning. The science of encrypting and decrypting information is called cryptography. In computing, unencrypted data is also known as plaintext, and encrypted data is called ciphertext.</p>		K1	EC402.4
9.	<p>What are the applications of SHA?</p> <p>SHA is the acronym for Secure Hash Algorithm, used for hashing data and certificate files. Every piece of data produces a unique hash that is thoroughly non-duplicable by any other piece of data. The resulting digital signature is unique too as it depends on the hash that's generated out of the data.</p>		K1	EC402.4
10.	<p>Define Digital Signature.</p> <p>A digital signature is an electronic, encrypted stamp of authentication on digital information such as messages. The digital signature confirms the integrity of the message.</p>		K1	EC402.4

PART - B (5 X 13 = 65 Marks)

II	ANSWER ALL QUESTIONS			Marks	BT Level	CO
11	(a)	<p>Explain in detail about UDP services and what are the advantages of UDP.</p> <p>i) Definition - 03 Marks</p> <p>ii) UDP services - 05 Marks</p>	13	K2	EC402.3	

			iii) Explanation - 03 Marks iv) Advantages - 02 Marks			
(OR)						
		(b)	Explain in detail about TCP services and also explain the advantages of TCP over UDP. i) Definition - 03 Marks ii) TCP flow - 05 Marks iii) Explanation - 03 Marks iv) Advantages - 02 Marks	13	K2	EC402.3
12		(a)	Explain in detail about TCP Connection establishment and termination using three-way handshake using neat diagrams. Also with neat sketch, explain in detail the events and transitions about the TCP State-Transition-Diagrams (STD). i) TCP Definition - 02 Marks ii) STD Flow - 06 Marks iii) Explanation - 05 Marks	13	K2	EC402.3
(OR)						
		(b)	Explain in detail about TCP congestion Avoidance Techniques. Also explain DECbit and RED algorithm for Congestion Avoidance i) Definition - 02 Marks ii) Diagram - 05 Marks iii) Explanation - 04 Marks iv) Advantages - 02 Marks	13	K2	EC402.3
13		(a)	Describe the token bucket mechanism for congestion control. With which other technique is token bucket usually combined to achieve complete flow control? What problems in the simpler approach are addressed by using a token bucket mechanism? i) Definition - 03 Marks ii) token bucket diagram - 07 Marks iii) Explanation - 03 Marks	13	K2	EC402.3
(OR)						
		(b)	Explain in detail about DNS and HTTP of Application layer Protocols. i) Definition - 04 Marks ii) DNS & HTTP diagram - 05 Marks iii) Explanation - 04 Marks	13	K2	EC402.3
14		(a)	Explain in detail about OSI Security Architecture. i) Definition - 02 Marks ii) Diagram - 06 Marks iii) Explanation - 05 Marks	13	K2	EC402.4
(OR)						
		(b)	Explain in detail about AES Structure with neat sketches.	13	K2	EC402.4

			i) Definition - 02 Marks ii) Diagram - 05 Marks iii) Explanation - 04 Marks iv) Advantages - 02 Marks					
15	(a)	Discuss in detail about RSA Algorithm. i) Definition - 02 Marks ii) Diagram - 05 Marks iii) Explanation - 04 Marks iv) Advantages - 02 Marks	13	K2	EC402.4			
(OR)								
	(b)	Explain in detail about Public Key Crypto Systems i) Definition - 02 Marks ii) Diagram - 05 Marks iii) Explanation - 04 Marks iv) Advantages - 02 Marks	13	K2	EC402.4			
PART - C (1 X 15 = 15 Marks)								
III	ANSWER ALL QUESTIONS					Mar ks	BT Level	CO
16	(a)	Suppose TCP operates over a 1-Gbps link, utilizing the full bandwidth continuously. How long will it take for the sequence numbers to wrap around completely? Suppose an added 32-bit timestamp field increments 1000 times during this wrap around time, how long will it take for the timestamp field to wrap around? a) This is 125MB/sec; the sequence numbers wrap around when we send 232 B = 4 GB. This would take $4GB/(125MB/sec) = 32$ seconds. b) Incrementing every 32 ms, it would take about $32 \times 4 \times 10^9ms$, or about four years, for the timestamp field to wrap.	15	K3	EC402.3			
(OR)								
	(b)	Explain the techniques to improve QoS in Transport layer protocols i) Definition - 02 Marks ii) Types and Diagram - 05 Marks iii) Explanation - 04 Marks iv) Advantages - 02 Marks	15	K3	EC402.3			

Blooms Levels: K1 - Remember, K2 - Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 - Create

CARE



COLLEGE OF ENGINEERING

Trichy - 620009

(A) 

INTERNAL ASSESSMENT TEST

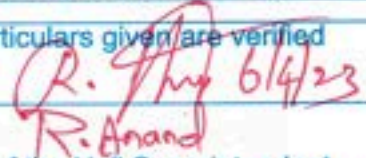
Reg. No. : 8 1 0 7 2 1 1 0 6 0 1

College Code Name	8107 CARE COLLEGE OF ENGINEERING		
Student Name	MEGANATH V		
Degree / Branch	BE ECE	Semester	04
Subject Code	EC3401	Date & Session	06/04/23 - AM
Subject Title	NETWORKS AND SECURITY	No. of Pages used	16



Chief Superintendent's Signature / Fescimile

All Particulars given/are verified



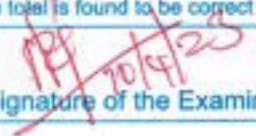
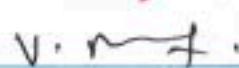
Name of the Hall Superintendent

Do not write the Register Number, Roll Number, College Code and the Name in any other part of the Answer Book
Instruction to the Candidate: Put (✓) for the questions attended in the tick mark column against each question

Q	✓	i		Marks	Q	✓	ii		Marks	✓	iii		Marks	Total Marks	Grand Total			
		C	B				C	B			C	B			CO 1	CO 2	CO 3	CO 4
		O	T				O	T			O	T						
1	✓	3	K1	2	11	a	✓	3	K2	2				5			31	16
2	✓	3	K1	2		b									CO 6	CO 7	CO 8	CO 9
3	✓	3	K1	1	12	a	✓	3	K2	2				5				
4	✓	3	K1	1		b												
5					13	a												
6	✓	3	K1	2		b												
7	✓	4	K1	2	14	a	✓	4	K1	1				11				
8	✓	4	K1	0		b												
9	✓	4	K1	1	15	a												
10	✓	4	K1	2		b												
					16	a	✓	3	K3	13				13				
						b												
Total		13			Total		34											

47.1

Declaration by the Examiner: Verified that all the questions attended by the student are valued and the total is found to be correct

10.04.2023	R. DEEPADEEVARAJI	
Date of Valuation	Name of the Examiner	Signature of the Examiner
		
Statement of student stating all Comments/ Corrections noted		Signature of the Candidate



INTERNAL ASSESSMENT TEST

Reg. No. : 8 1 0 7 2 1 1 0 6 0

College Code Name	8107- CARE COLLEGE OF ENGINEERING		
Student Name	KAYAL VIXHIR		
Degree / Branch	B.E - ECE	Semester	IV
Subject Code	EC3A01	Date & Session	06/09/23
Subject Title	NETWORKS AND SECURITY	No. of Pages used	24

S. Shant

Chief Superintendent's Signature / Fescimile

All Particulars given are verified

K. Saravanan
Name of the Hall Superintendent

Do not write the Register Number, Roll Number, College Code and the Name in any other part of the Answer Book
Instruction to the Candidate. Put (✓) for the questions attended in the tick mark column against each question

Q	✓	i		Marks	Q	✓	ii		Marks	✓	iii		Marks	Total Marks	Grand Total														
		C	B				C	B			C	O			T	CO 1	CO 2	CO 3	CO 4										
1	-	K1	3	2	11	a	✓	3	K2	12																			
2	-	K1	3	2		b								12				34											
3	-	K1	3	2	12	a																							
4	-	K1	3	2		b																							
5					13	a																							
6	-	K1	4	2		b																							
7	-	K1	4	2	14	a	✓	4	K2	12				12															
8	-	K1	4	2		b																							
9	-	K1	4	2	15	a	✓	4	K2	12				12															
10	-	K1	4	2		b																							
					16	a																							
						b	-	3	K3	13				13															
Total														18	Total														49

67.1

Declaration by the Examiner: Verified that all the questions attended by the student are valued and the total is found to be correct

10-04-2023 Date of Valuation	R. DEEPAKARATHY Name of the Examiner	<i>R.P.</i> Signature of the Examiner
Statement of student stating all Comments/ Corrections noted		<i>Kay.R</i> Signature of the Candidate

Department of ECE

EC3401- Networks & Security

Retest Question Paper

Part A (10*2 - 20)

1. What is congestion and Congestion control?
2. Differentiate UDP and TCP
3. Write approaches use to support QOS
4. What do you mean by encipherment?
5. What are the applications of SHA?
6. Define Digital Signature.
7. List the classifications of SCA
8. List three categories of Reverse Engineering and their differences
9. Define attack vectors
10. What is meant by Block chain technology

Part B (3*10=30)

1. Explain in detail about TCP services and also explain the advantages of TCP over UDP
2. Explain on Fault-injection-attack with neat diagrams
3. Discuss in detail about the RSA Algorithm.

~~Faculty-In charge~~

J. Jayaram
HOD/ECE

HEAD
Dept. of Electronics and Communication Engg.
CARE College of Engineering
Trichy-620 009

(Approved by AICTE and Affiliated to Anna University, Chennai)
27, Thayanur, Trichy - 620009

Dept of ECE

Special Coaching/ Remedial Class Schedule
II ECE (2022 - 2023 EVEN)

Subject Name: EC3401 - Networks & Security
Faculty In-charge: Mrs.R.Deepalakshmi

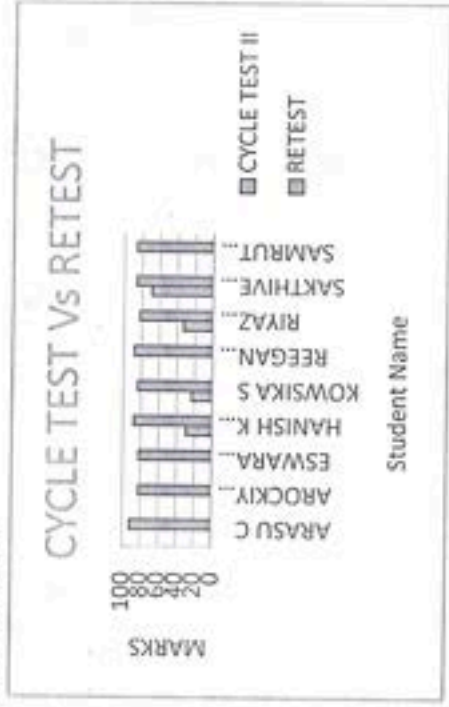
Batch: 2021-2025

S. No.	Reg. No.	Student Name	Topics	Topics
1	810721106001	ARASU C	Unit 3	Unit 4
2	810721106002	AROCKIYA JAYARAJ S		
3	810721106006	ESWARAMOORTHIM		
4	810721106007	HANISH K A		
5	810721106010	KOWSIKA S		
6	810721106013	REEGAN RUSOUL L		
7	810721106014	RIYAZ KHAN S		
8	810721106015	SAKTHIVEL N		
9	810721106016	SAMRUTH SRIRAM D		

S. No.	Reg. No.	Student Name	CYCLE TEST I	RETEST
1	810721106001	ARASU C	AB	92
2	810721106002	AROCKIYA JAYARAJ S	AB	82
3	810721106006	ESWARAMOORTHIM	AB	82
4	810721106007	HANISH K A	29	88
5	810721106010	KOWSIKA S	23	84
6	810721106013	REEGAN RUSOUL L	AB	88
7	810721106014	RIYAZ KHAN S	33	82
8	810721106015	SAKTHIVEL N	69	86
9	810721106016	SAMRUTH SRIRAM D	AB	86

Activities Planned During this Schedule:

1. Previous Year question papers discussion
2. Tutorial Problems discussion



Networks
And
Security

NAME : D. SAMRUTH S
CLASS : IInd - ECE
REG. No. : 810721106016

PART - 'A'

43/50

86/1

1. Congestion :

When too many packets are present in the subnet, the performance of the network will be degraded. This situation is called congestion.

Congestion Control :

Congestion control refers to the techniques and mechanisms that can either prevent congestion before it happens or remove congestion after it has happened.

2.

~~UDP~~ TCP

~~TCP~~ UDP

It is a connection-^{oriented} Protocol


It is Connectionless Protocol

It provides Reliable Delivery

It provides unreliable Service

Sockets of TCP is usually identified by means of 4-tuple

UDP Socket is identified by of Two Tuple.

821


1. When too many packets are present in the network. The performance of the network is degraded. This situation is called congestion control.

Congestion control refers to the techniques and mechanisms that can help prevent congestion. Congestion happens as over-congestion after it has happened in a network it means the load exceeds its capacity.

2. UDP

It is a connection oriented protocol

It provides reliable delivery

packets in TCP is usually identified they means of 4 tuple

Top
 It is connectionless protocol

It provides unreliable delivery

UDP packet is when they means of three tuple

- 3:
- * packet scheduling
 - * traffic shaping
 - * admission control
 - * resource reservation

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

EVEN SEMESTER 2022-2023 TIME TABLE – MODEL EXAMINATION - I (02.05.2023 TO 09.05.2023)

DATE	SESSION	IV YEAR		III YEAR		II YEAR	
02.05.2023	AN 01:45 P.M TO 04.45 P.M	GE8076	PROFESSIONAL ETHICS IN ENGINEERING	EC8652	WIRELESS COMMUNICATION	EC3491	COMMUNICATION SYSTEMS
03.05.2023	AN 01:45 P.M TO 04.45 P.M	EC8094	SATELLITE COMMUNICATION	EC8691	MICROPROCESSORS AND MICROCONTROLLERS	EC3401	NETWORKS & SECURITY
04.05.2023	AN 01:45 P.M TO 04.45 P.M	****	*****	EC8095	VLSI DESIGN	EC3452	ELECTROMAGNETIC FIELDS
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08.05.2023	AN 01:45 P.M TO 04.45 P.M	****	*****	MG8591	PRINCIPLES OF MANAGEMENT	EC3492	DIGITAL SIGNAL PROCESSING
09.05.2023	AN 01:45 P.M TO 04.45 P.M	****	*****	****	*****	GE3451	ENVIRONMENTAL SCIENCES AND SUSTAINABILITY

K. Lakshmi
 EXAM CELL

S. Jeyaraj
 HEAD

S. Jeyaraj
 PRINCIPAL

Reg Number

CARE COLLEGE OF ENGINEERING, TRICHY
DEPARTMENT OF ECE

CLASS	: II B.E ECE	MAX MARKS	: 100
SEMESTER	: IV	DURATION	: 03 Hours
SUBJECT	: NETWORKS & SECURITY	CODE	: EC3401
COURSE NO	: EC402	DATE	: 03.05.2023
ACADEMIC YEAR	: 2022 – 23 (EVEN)	EXAM	: MODEL EXAM I

PART – A (10 X 2 = 20 Marks)

I	ANSWER ALL QUESTIONS		BT level	CO
1.	What is congestion and Congestion control?		K1	EC402.
2.	Differentiate UDP and TCP		K1	EC402.
3.	Write approaches use to support QOS		K1	EC402.
4.	What do you mean by encipherment?		K1	EC402.
5.	What re the applications of SHA?		K1	EC402.
6.	Define Digital Signature.		K1	EC402.
7.	List the classifications of SCA		K1	EC402.5
8.	List three categories of Reverse Engineering and their differences		K1	EC402.5
9.	Define attack vectors		K1	EC402.5
10.	What is meant by Block chain technology		K1	EC402.5

PART – B (5 X 13 = 65 Marks)


II	ANSWER ALL QUESTIONS		Marks	BT Level	CO
11	(a)	Explain in detail about TCP Connection establishment and termination using three-way handshake using neat diagrams. Also with neat sketch, explain in detail the events and transitions about the TCP State-Transition-Diagrams(STD)	13	K2	EC402.
(OR)					
	(b)	Explain in detail about TCP services and also explain the advantages of TCP over UDP	13	K2	EC402.
12	(a)	Explain in detail about TCP congestion Avoidance Techniques. Also explain DECbit and RED algorithm for Congestion Avoidance	13	K2	EC402.
(OR)					
	(b)	Explain in detail about DNS and HTTP of Application layer Protocols	13	K2	EC402.
13	(a)	Explain in detail about AES Structure with neat sketches.	13	K2	EC402.
(OR)					
	(b)	Explain in detail about Public Key Crypto Systems	13	K2	EC402.

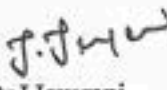
14	(a)	Explain in detail about OSI Security Architecture.	13	K2	EC402.4
(OR)					
	(b)	Discuss in detail about RSA Algorithm.	13	K2	EC402.4
15	(a)	Explain on Fault-injection-attack with neat diagrams	13	K2	EC402.5
(OR)					
	(b)	Discuss about the layers of a computing system with neat diagram	13	K2	EC402.5

PART - C (1 X 15 = 15 Marks)

III	ANSWER ALL QUESTIONS		Marks	BT Level	CO
16	(a)	Illustrate the Hardware Trojan Taxonomy	15	K3	EC402.5
(OR)					
	(b)	Illustrate the Taxonomy of the side channel attacks	15	K3	EC402.5

Blooms Levels: K1 - Remember, K2 - Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 - Create


 R. Deepa Lakshmi AP/ECE
 Faculty In-charge


 Dr. J. Jeyarani
 HOD


 Dr. S. Shanthi
 Principal

Reg Number

CARE COLLEGE OF ENGINEERING, TRICHY
DEPARTMENT OF ECE

CLASS:	: II B.E ECE	MAX MARKS	: 100
SEMESTER:	: IV	DURATION	: 03 HOURS
SUBJECT:	: NETWORKS & SECURITY	CODE	: EC3401
COURSE NO	: EC402	DATE	: 03.05.2023
ACADEMIC YEAR	: 2022 – 23 (EVEN)	EXAM	: MODEL EXAM I

PART – A (10 X 2 = 20 Marks)

1	ANSWER ALL QUESTIONS	BT level	CO																				
1.	<p>What is congestion and Congestion control? Closed loop congestion control technique is used to treat or alleviate congestion after it happens. Several techniques are used by different protocols; some of them are: Backpressure: Backpressure is a technique in which a congested node stop receiving packet from upstream node. Congestion control is a method used for monitoring the process of regulating the total amount of data entering the network so as to keep traffic levels at an acceptable value.</p>	K1	EC402.3																				
2.	<p>Differentiate UDP and TCP</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Sr. No.</th> <th style="text-align: center;">Key</th> <th style="text-align: center;">TCP (Transmission Control Protocol)</th> <th style="text-align: center;">UDP (User Datagram Protocol)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">Definition</td> <td>It is a communications protocol using which the data is transmitted between systems over the network. In this, the data is transmitted into the form of packets. It includes error-checking, guarantees the delivery and preserves the order of the data packets.</td> <td>It is same as the TCP protocol except this doesn't guarantee the error-checking and data recovery. If you use this protocol, the data will be sent continuously, irrespective of the issues in the receiving end.</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">Design</td> <td>TCP is a connection oriented protocol.</td> <td>UDP is a connection less protocol.</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">Reliable</td> <td>As TCP provides error checking support and also guarantees delivery of data to the destination router this make it more reliable as compared to UDP.</td> <td>While on other hand UDP does provided only basic error checking support using checksum so the delivery of data to the destination cannot be guaranteed in UDP as compared to that in case of TCP.</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">Data transmission</td> <td>In TCP the data is transmitted in a particular sequence which means</td> <td>On other hand there is no sequencing of data in UDP in order to implement</td> </tr> </tbody> </table>	Sr. No.	Key	TCP (Transmission Control Protocol)	UDP (User Datagram Protocol)	1	Definition	It is a communications protocol using which the data is transmitted between systems over the network. In this, the data is transmitted into the form of packets. It includes error-checking, guarantees the delivery and preserves the order of the data packets.	It is same as the TCP protocol except this doesn't guarantee the error-checking and data recovery. If you use this protocol, the data will be sent continuously, irrespective of the issues in the receiving end.	2	Design	TCP is a connection oriented protocol.	UDP is a connection less protocol.	3	Reliable	As TCP provides error checking support and also guarantees delivery of data to the destination router this make it more reliable as compared to UDP.	While on other hand UDP does provided only basic error checking support using checksum so the delivery of data to the destination cannot be guaranteed in UDP as compared to that in case of TCP.	4	Data transmission	In TCP the data is transmitted in a particular sequence which means	On other hand there is no sequencing of data in UDP in order to implement	K1	EC402.3
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4	Data transmission	In TCP the data is transmitted in a particular sequence which means	On other hand there is no sequencing of data in UDP in order to implement																				
3.	<p>Write approaches use to support QOS There are two principal approaches to QoS in modern packet-switched IP networks, a parameterized system based on an exchange of application requirements with the network, and a prioritized system where each packet identifies a desired service level to the network.</p>	K1	EC402.3																				
4.	<p>What do you mean by encipherment? Encryption is the method by which information is converted into secret code that hides the information's true meaning. The science of encrypting and decrypting information is called cryptography. In computing, unencrypted data is also known as plaintext, and encrypted data is called ciphertext.</p>	K1	EC402.4																				
5.	<p>What are the applications of SHA?</p>	K1	EC402.4																				

		SHA is the acronym for Secure Hash Algorithm, used for hashing data and certificate files. Every piece of data produces a unique hash that is thoroughly non-duplicable by any other piece of data. The resulting digital signature is unique too as it depends on the hash that's generated out of the data.		
6.		Define Digital Signature. A digital signature is an electronic, encrypted stamp of authentication on digital information such as messages. The digital signature confirms the integrity of the message.	K1	EC402.4
7.		List the classifications of SCA An attack enabled by leakage of information from a physical cryptosystem. Characteristics that could be exploited in a side-channel attack include timing, power consumption, and electromagnetic and acoustic emissions.	K1	EC402.5
8.		List three categories of Reverse Engineering and their differences <ul style="list-style-type: none"> • System Level Analysis. It analyzes the operations, functions, timing, signal paths, and interconnections of each electronic module. ... • Process analysis. Process analysis of chips is straightforward in theory, since microanalytical tools have been around for some time. • Circuit extraction. 	K1	EC402.5
9.		Define attack vectors An attack vector differs from an attack surface, as the vector is the means by which an intruder gains access and the attack surface is what is being attacked.	K1	EC402.5
10.		What is meant by Block chain technology A blockchain is a type of distributed database or ledger—one of today's top tech trends—which means the power to update a blockchain is distributed between the nodes, or participants, of a public or private computer network. This is known as distributed ledger technology, or DLT.	K1	EC402.5

PART – B (5 X 13 = 65 Marks)

II	ANSWER ALL QUESTIONS			Ma rks	BT Level	CO
11	(a)	<p>Explain in detail about TCP Connection establishment and termination using three-way handshake using neat diagrams. Also with neat sketch, explain in detail the events and transitions about the TCP State-Transition-Diagrams (STD)</p> <p>i) TCP Definition - 02 Marks ii) STD Flow - 06 Marks iii) Explanation - 05 Marks</p>	13	K2	EC402.3	
(OR)						
	(b)	<p>Explain in detail about TCP services and also explain the advantages of TCP over UDP</p> <p>i) Definition - 03 Marks ii) TCP flow - 05 Marks iii) Explanation - 03 Marks iv) Advantages - 02 Marks</p>	13	K2	EC402.3	
12	(a)	<p>Explain in detail about TCP congestion Avoidance Techniques. Also explain DECbit and RED algorithm for Congestion</p>	13	K2	EC402.3	

			Avoidance i) Definition - 02 Marks ii) Diagram - 05 Marks iii) Explanation - 04 Marks iv) Advantages - 02 Marks			
(OR)						
		(b)	Explain in detail about DNS and HTTP of Application layer Protocols i) Definition - 04 Marks ii) DNS & HTTP diagram - 05 Marks iii) Explanation - 04 Marks	13	K2	EC402.3
	13	(a)	Explain in detail about AES Structure with neat sketches. i) Definition - 02 Marks ii) Diagram - 05 Marks iii) Explanation - 04 Marks iv) Advantages - 02 Marks	13	K2	EC402.4
(OR)						
		(b)	Explain in detail about Public Key Crypto Systems i) Definition - 02 Marks ii) Diagram - 05 Marks iii) Explanation - 04 Marks iv) Advantages - 02 Marks	13	K2	EC402.4
	14	(a)	Explain in detail about OSI Security Architecture. i) Definition - 02 Marks ii) Diagram - 06 Marks iii) Explanation - 05 Marks	13	K2	EC402.4
(OR)						
		(b)	Discuss in detail about RSA Algorithm. i) Definition - 02 Marks ii) Diagram - 05 Marks iii) Explanation - 04 Marks iv) Advantages - 02 Marks	13	K2	EC402.4
	15	(a)	Explain on Fault-injection-attack with neat diagrams i) Definition - 02 Marks ii) Diagram - 05 Marks iii) Explanation - 06 Marks	13	K2	EC402.5
(OR)						
		(b)	Discuss about the layers of a computing system with neat diagram i) Definition - 02 Marks ii) Layering Diagram - 05 Marks iii) Explanation - 06 Marks	13	K2	EC402.5

PART - C (1 X 15 = 15 Marks)

III	ANSWER ALL QUESTIONS			Marks	BT Level	CO
16	(a)		Illustrate the Hardware Trojan Taxonomy i) Definition - 02 Marks ii) Diagram - 05 Marks iii) Explanation - 04 Marks iv) Identification Methods and Explanation - 04 Marks	15	K3	EC402.5
(OR)						
	(b)		Illustrate the Taxonomy of the side channel attacks i) Definition - 02 Marks ii) Diagram - 05 Marks iii) Explanation - 04 Marks iv) Identification Methods and Explanation - 04 Marks	15	K3	EC402.5

Blooms Levels: K1 - Remember, K2 - Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 - Create

(A)

MODEL EXAMINATION

Reg. No. : 8 1 0 7 2 1 1 0 6 0 0

College Code Name	8107 / CARE COLLEGE OF ENGINEERING		
Student Name	Helen Priulla . X		
Degree / Branch	B.E / ECE	Semester	IV
Subject Code	EC3A01	Date & Session	3/5/23
Subject Title	NETWORKS & SECURITY.	No. of Pages used	

S. Shankar

Chief Superintendent's Signature / Fescimile

All Particulars given are verified

Name of the Hall Superintendent

Do not write the Register Number, Roll Number, College Code and the Name in any other part of the Answer Book
Instruction to the Candidate. Put (✓) for the questions attended in the tick mark column against each question

Q	✓	C O	B T	Marks	Q	✓	C O	B T	Marks	✓	C O	B T	Marks	✓	C O	B T	Marks	Total Marks	Grand Total																		
																			CO 1	CO 2	CO 3	CO 4															
1	✓	3	K ₁	2	11																																
2	✓	3	K ₁	2					3	✓	K ₂		12					12																			
3	✓	3	K ₁	2	12																																
4									3	✓	K ₂		05					05																			
5					13				A	✓	K ₂		12					12																			
6																																					
7	✓	5	K ₁	1	14																																
8	✓	5	K ₁	1					A	✓	K ₂		12					12																			
9					15																																
10																																					
					16				5	✓	K ₃		11					11																			
Total																		8	Total																		52

Declaration by the Examiner: Verified that all the questions attended by the student are valued and the total is found to be correct

04.05.2023 Date of Valuation	R. DEEPAKARISHMI Name of the Examiner	 Signature of the Examiner
Noted		Helen Priulla . X Signature of the Candidate
Statement of student stating all Comments/ Corrections noted		

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

EVEN SEMESTER 2022-2023 TIME TABLE – MODEL EXAMINATION - II (15.05.2023 TO 20.05.2023)

DATE	SESSION	III YEAR		II YEAR	
15.05.2023	AN 01:45 P.M TO 04:45 P.M	EC8652	WIRELESS COMMUNICATION	EC3492	DIGITAL SIGNAL PROCESSING
16.05.2023	AN 01:45 P.M TO 04:45 P.M	EC8691	MICROPROCESSORS AND MICROCONTROLLERS	EC3401	NETWORKS & SECURITY
17.05.2023	AN 01:45 P.M TO 04:45 P.M	EC8095	VLSI DESIGN	EC3452	ELECTROMAGNETIC FIELDS
18.05.2023	AN 01:45 P.M TO 04:45 P.M	EC8651	TRANSMISSION LINES AND RF SYSTEMS	EC3451	LINEAR INTEGRATED CIRCUITS
19.05.2023	AN 01:45 P.M TO 04:45 P.M	****	*****	EC3491	COMMUNICATION SYSTEMS
20.05.2023	AN 01:45 P.M TO 04:45 P.M	MG8591	PRINCIPLES OF MANAGEMENT	GE3451	ENVIRONMENTAL SCIENCES AND SUSTAINABILITY

S. Chandrasekhar
EXAM CELL

S. Prakash
PRINCIPAL

Reg Number

CARE COLLEGE OF ENGINEERING, TRICHY
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

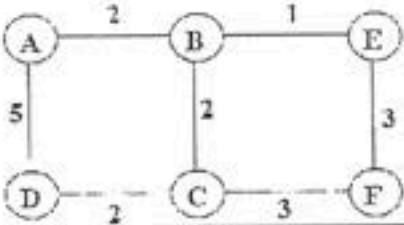
CLASS	: II B.E ECE	MAX MARKS	: 100
SEMESTER	: IV	DURATION	: 03 HOURS
SUBJECT	: NETWORKS & SECURITY	CODE	: EC3401
COURSE NO.	: EC402	DATE	: 16.05.2023
ACADEMIC YEAR	: 2022 - 23 (EVEN)	EXAM	: MODEL- II

PART - A (10 X 2 = 20 Marks)

I	ANSWER ALL QUESTIONS		BT Level	CO
1.	What is meant by Bit stuffing? Give an example		K1	EC402.1
2.	Why we go for layering?		K1	EC402.1
3.	Specify the type of errors handles by the ICMP Messages.		K1	EC402.2
4.	Find the class of each address i) 10001000 01000010 00101000 01001111 ii) 226.27.43.240		K1	EC402.2
5.	Give the comparison between leaky bucket and token bucket algorithms.		K1	EC402.3
6.	Differentiate UDP and TCP		K1	EC402.3
7.	Name the different types of Security Attacks.		K1	EC402.4
8.	What re the applications of SHA?		K1	EC402.4
9.	List the classifications of SCA		K1	EC402.5
10.	What is meant by Block chain technology		K1	EC402.5

PART - B (5 X 13 = 65 Marks)

II	ANSWER ALL QUESTIONS		Marks	BT Level	CO
11	(a)	Draw OSI Network layer architecture and explain its Functionality	13	K2	EC402.1
(OR)					
	(b)	Explain in detail about IEEE 802.11 Standard. Also explain howit differs from IEEE 802.3 standard.	13	K2	EC402.1
12	(a)	Discuss the fundamentals and advantages of open shortest path first protocol	13	K2	EC402.2
(OR)					
	(b)	With an example network scenario explain the mechanism ofRouting Information Protocol and specify the routing tablecontents.	13	K2	EC402.2

13	(a)	Explain in detail about HTTP of Application layer Protocols	13	K2	EC402.3		
(OR)							
	(b)	Explain in detail about TCP Connection establishment and termination using three-way handshake using neat diagrams. Also with neat sketch, explain in detail the events and transitions about the TCP State-Transition-Diagrams (STD)	13	K2	EC402.3		
14	(a)	Explain in detail about AES Structure with neat sketches.	13	K2	EC402.4		
(OR)							
	(b)	Discuss in detail about RSA Algorithm.	13	K2	EC402.4		
15	(a)	Illustrate the Hardware Trojan Taxonomy	13	K2	EC402.5		
(OR)							
	(b)	Illustrate the Taxonomy of the side channel attacks	13	K2	EC402.5		
PART - C (1 X 15 = 15 Marks)							
III	ANSWER ALL QUESTIONS				Marks	BT Level	CO
16	(a)	Explain the function of Distance vector routing protocol for this given figure. Also explain link state routing with proper examples <div style="text-align: center;">  <pre> graph TD A((A)) --- 2 B((B)) B --- 1 E((E)) A --- 5 D((D)) B --- 2 C((C)) E --- 3 F((F)) D --- 2 C C --- 3 F </pre> </div>	15	K3	EC402.2		
(OR)							
	(b)	(i) There are two popular technologies for Local Area Network (LAN) design, namely IEEE 802.3 Ethernet and IEEE 802.11 WiFi. Use your knowledge of these technologies to answer the following questions: i) What Data link layer service model is provided by each of these LAN technologies? How are they similar? How are they different? ii) List three similarities about Ethernet and WiFi. iii) Which of these two LAN technologies has the higher bit error rate, and why? iv) Which LAN technology provides better support for mobile users, and how? v) List and explain any two other features of WiFi technology that are not available (or even possible) in Ethernet LANs	08	K3	EC402.2		

		(ii)	Answer the following questions: i) What is the polynomial representation of 110111? ii) What is the result of shifting 111000 three bits to the left? iii) Repeat part (ii) using polynomials. iv) What is the result of shifting 110011 four bits to the right? Repeat part (iv) using polynomials.	07	K3	EC402.2
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Blooms Levels: K1 - Remember, K2 - Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 - Create


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DEPARTMENT OF ECE

CLASS:	: II B.E ECE	MAX MARKS	: 100
SEMESTER:	: IV	DURATION	: 03 HOURS
SUBJECT:	: NETWORKS & SECURITY	CODE	: EC3401
COURSE NO	: EC402	DATE	: 16.05.2023
ACADEMIC YEAR	: 2022 – 23 (EVEN)	EXAM	: MODEL EXAM II

PART – A (10 X 2 = 20 Marks)

I	ANSWER ALL QUESTIONS	BT level	CO										
1.	<p>What is meant by Bit stuffing? Give an example Bit stuffing is the mechanism of inserting one or more non-information bits into a message to be transmitted, to break up the message sequence, for synchronization purpose.</p>	K1	EC402.1										
2.	<p>Why we go for layering? The layered concept of networking was developed to accommodate changes in technology. Each layer of a specific network model may be responsible for a different function of the network. Each layer will pass information up and down to the next subsequent layer as data is processed.</p>	K1	EC402.1										
3.	<p>Specify the type of errors handles by the ICMP Messages. ICMP uses the source IP address to send the error message to the source (originator) of the datagram. Five types of errors are handled: destination unreachable, source quench, time exceeded, parameter problems, and redirection</p>	K1	EC402.2										
4.	<p>Find the class of each address i) 10001000 01000010 00101000 01001111 (Class B) ii) 226.27.43.240 (Class E)</p>	K1	EC402.2										
5.	<p>Give the comparison between leaky bucket and token bucket algorithms.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Leaky Bucket Algorithm</th> <th style="text-align: center;">Token Bucket Algorithm</th> </tr> </thead> <tbody> <tr> <td>The packets are thrown into the bucket</td> <td>It holds packets generated at regular intervals of time.</td> </tr> <tr> <td>The bucket leaks at a constant rate</td> <td>It has a maximum capacity.</td> </tr> <tr> <td>The output comes at a finite rate.</td> <td>The packet cannot be sent if there are no tokens in the bucket.</td> </tr> <tr> <td>It converts bursty traffic into uniform traffic.</td> <td>When there is a ready packet, a token is removed and the packet is sent.</td> </tr> </tbody> </table>	Leaky Bucket Algorithm	Token Bucket Algorithm	The packets are thrown into the bucket	It holds packets generated at regular intervals of time.	The bucket leaks at a constant rate	It has a maximum capacity.	The output comes at a finite rate.	The packet cannot be sent if there are no tokens in the bucket.	It converts bursty traffic into uniform traffic.	When there is a ready packet, a token is removed and the packet is sent.	K1	EC402.3
Leaky Bucket Algorithm	Token Bucket Algorithm												
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It converts bursty traffic into uniform traffic.	When there is a ready packet, a token is removed and the packet is sent.												
6.	Differentiate UDP and TCP	K1	EC402.3										

Sr. No.	Key	TCP (Transmission Control Protocol)	UDP (User Datagram Protocol)		
1	Definition	It is a communications protocol, using which the data is transmitted between systems over the network. In this, the data is transmitted into the form of packets. It includes error-checking, guarantees the delivery and preserves the order of the data packets.	It is same as the TCP protocol except this doesn't guarantee the error-checking and data recovery. If you use this protocol, the data will be sent continuously, irrespective of the issues in the receiving end.		
2	Design	TCP is a connection oriented protocol.	UDP is a connection less protocol.		
3	Reliable	As TCP provides error checking support and also guarantees delivery of data to the destination router this make it more reliable as compared to UDP.	While on other hand UDP does provided only basic error checking support using checksum so the delivery of data to the destination cannot be guaranteed in UDP, as compared to that in case of TCP.		
4	Data transmission	In TCP the data is transmitted in a particular sequence which means	On other hand there is no sequencing of data in UDP in order to implement		
7.	Name the different types of Security Attacks. <ul style="list-style-type: none"> • Malware-based attacks. • Phishing attacks. • Man-in-the-middle attacks. • Denial of Service attacks. • SQL injection attacks. • DNS tunneling. • Zero-day exploits. • Password attacks. 			K1	EC402.4
8.	What re the applications of SHA? SHA is the acronym for Secure Hash Algorithm, used for hashing data and certificate files. Every piece of data produces a unique hash that is thoroughly non-duplicable by any other piece of data. The resulting digital signature is unique too as it depends on the hash that's generated out of the data.			K1	EC402.4
9.	List the classifications of SCA An attack enabled by leakage of information from a physical cryptosystem. Characteristics that could be exploited in a side-channel attack include timing, power consumption, and electromagnetic and acoustic emissions.			K1	EC402.5
10.	What is meant by Block chain technology A blockchain is a type of distributed database or ledger—one of today's top tech trends—which means the power to update a blockchain is distributed between the nodes, or participants, of a public or private computer network. This is known as distributed ledger technology, or DLT.			K1	EC402.5

PART – B (5 X 13 = 65 Marks)

II	ANSWER ALL QUESTIONS			Marks	BT Level	CO
11	(a)	Draw OSI Network layer architecture and explain its Functionality Different types of layers – 05 Marks Functions of Layers with diagram – 05 Marks Explanation – 03 Marks	13	K2	EC402.1	
(OR)						
	(b)	Explain in detail about IEEE 802.11 Standard. Also explain how it differs from IEEE 802.3 standard. Architecture – 05 Marks	13	K2	EC402.1	

			Flow diagram – 05 Marks Explanation – 03 Marks			
12	(a)		Discuss the fundamentals and advantages of open shortest path first protocol i) OSPF definition - 02 Marks ii) Diagram of routers - 06 Marks ii) Explanation - 05 Marks	13	K2	EC402.2
(OR)						
	(b)		With an example network scenario explain the mechanism of Routing Information Protocol and specify the routing table contents. i) RIP definition - 02 Marks ii) Diagram of routers - 06 Marks ii) Explanation - 05 Marks	13	K2	EC402.2
13	(a)		Explain in detail about HTTP of Application layer Protocols i) Definition - 04 Marks ii) HTTP diagram - 05 Marks iii) Explanation - 04 Marks	13	K2	EC402.3
(OR)						
	(b)		Explain in detail about TCP Connection establishment and termination using three-way handshake using neat diagrams. Also with neat sketch, explain in detail the events and transitions about the TCP State-Transition-Diagrams (STD) i) TCP Definition - 02 Marks ii) STD Flow - 06 Marks iii) Explanation - 05 Marks	13	K2	EC402.3
14	(a)		Explain in detail about AES Structure with neat sketches. i) Definition – 02 Marks ii) Diagram - 05 Marks iii) Explanation - 04 Marks iv) Advantages – 02 Marks	13	K2	EC402.4
(OR)						
	(b)		Discuss in detail about RSA Algorithm. i) Definition – 02 Marks ii) Diagram - 05 Marks iii) Explanation - 04 Marks iv) Advantages – 02 Marks	13	K2	EC402.4
15	(a)		Illustrate the Hardware Trojan Taxonomy i) Definition – 02 Marks ii) Diagram - 05 Marks iii) Explanation - 04 Marks iv) Identification Methods and Explanation – 02 Marks	13	K2	EC402.5
(OR)						
	(b)		Illustrate the Taxonomy of the side channel attacks i) Definition – 02 Marks ii) Diagram - 05 Marks	13	K2	EC402.5

iii) Explanation - 04 Marks

iv) Identification Methods and Explanation – 02 Marks

PART – C (1 X 15 = 15 Marks)

III

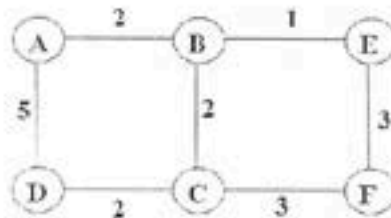
ANSWER ALL QUESTIONS

Mar
ks

BT
Level

CO

Explain the function of Distance vector routing protocol for this given figure. Also explain link state routing with proper examples



Information stored at node	Distance to Reach node						
	A	B	C	D	E	F	G
A	0	1	1	∞	1	1	∞
B	1	0	1	∞	∞	∞	∞
C	1	1	0	1	∞	∞	∞
D	∞	∞	1	0	∞	∞	1
E	1	∞	∞	∞	0	∞	∞
F	1	∞	∞	∞	∞	0	1
G	∞	∞	∞	1	∞	1	0

16 (a)

15

K3

EC 2

(OR)

There are two popular technologies for Local Area Network (LAN) design, namely IEEE 802.3 Ethernet and IEEE 802.11 WiFi. Use your knowledge of these technologies to answer the following questions:

- i) What Data link layer service model is provided by each of these LAN technologies? How are they similar? How are they different?
- ii) List three similarities about Ethernet and WiFi.
- iii) Which of these two LAN technologies has the higher bit error rate, and why?
- iv) Which LAN technology provides better support for mobile users, and how?
- v) List and explain any two other features of WiFi technology that are not available (or even possible) in Ethernet LANs

08

K3

EC402.2

ii)

Answer the following questions:

- i) What is the polynomial representation of 110111?
- ii) What is the result of shifting 111000 three bits to the left?
- iii) Repeat part (ii) using polynomials.
- iv) What is the result of shifting 110011 four bits to the right? Repeat part (iv) using polynomials.

07

K3

EC402.2

			<p>1. Polynomial Representation: We must ignore the powers of zero and negative. We have 110111 so it becomes $1x^5 + x^4 + x^3 + x^2 + x^1 + x^0$</p> <p>2,3. Bit Shifting We have 111000, which is 56 in Decimal 3 bits to the left – 111000000, which is 448 in Decimal in Poly, 111000 is $1x^5 + x^4 + x^3$ 3 bits to the left – 111000000 is $1x^8 + x^7 + x^6$</p> <p>4,5. Bit Shifting We have 110011, which is 51 in Decimal 4 bits to the right – 11, which is 3 in decimal in Poly, 110011 is $1x^5 + x^4 + x^1 + x^0$ 4 bits to the right – 11 is $1x^1 + x^0$</p>			
--	--	--	---	--	--	--

Blooms Levels: K1 - Remember, K2 – Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 – Create

CARE



COLLEGE OF ENGINEERING

Trichy - 620009

(A)

MODEL EXAMINATION

Reg. No. : 8 1 0 7 2 1 1 0 6 0 0

College Code Name	8107 - CARE COLLEGE OF ENGINEERING		
Student Name	KAYAL VIXHIR		
Degree / Branch	B.E - ECE	Semester	IV
Subject Code	EC3A01	Date & Session	16/5/23 AM
Subject Title	NETWORKS AND SECURITY	No. of Pages used	27

S. Shankar

Chief Superintendent's Signature / Fescimile

All Particulars given are verified

Y.D. Christina Merlen

Name of the Hall Superintendent

Do not write the Register Number, Roll Number, College Code and the Name in any other part of the Answer Book
Instruction to the Candidate. Put (✓) for the questions attended in the tick mark column against each question

					i				ii				iii				Total Marks	Grand Total				
Q	✓	C O	B T	Marks	Q	✓	C O	B T	Marks	✓	C O	B T	Marks	✓	C O	B T	Marks		CO 1	CO 2	CO 3	CO 4
1	✓	1	B	2	11	a	✓	1	B	2								12	14	29	14	13
2			A	—		b													CO 6	CO 7	CO 8	CO 9
3	✓	2	B	2	12	a												10				
4	✓	2	B	2		b	✓	2	B	10												
5	✓	3	B	2	13	a												6				
6	✓	3	B	2		b	✓	3	B	10												
7	✓	A	A	2	14	a												9				
8	✓	4	B	2		b	✓	A	B	9												
9	✓	5	B	1	15	a												4				
10				—		b	✓	5	B	4												
					16	a																
						b	✓	2	B	8	✓	2	B	7					15			
Total				15	Total												67					

82!

6

Declaration by the Examiner: Verified that all the questions attended by the student are valued and the totals found to be correct

17.05.2023	R. DEEPAKESHI	17/5/23
Date of Valuation	Name of the Examiner	Signature of the Examiner

No correction	- R
Statement of student stating all Comments/ Corrections noted	Signature of the Candidate

CARE

COLLEGE OF ENGINEERING

Trichy - 620009

(A) ~~BB~~
Q.No BT Level not fit

MODEL EXAMINATION

Reg. No. : 3 1 0 7 2 1 1 0 6 0 1

College Code Name	8107 CARE COLLEGE OF ENGINEERING		
Student Name	MEGANATH V		
Degree / Branch	BE / ECE	Semester	04
Subject Code	EC 3401	Date & Session	16/05/23 AM
Subject Title	NETWORK & SECURITY	No. of Pages used	

S. Shankar

Chief Superintendent's Signature / Escimile

All Particulars given are verified
P. V. Sankar
P. VANDANA
Name of the Hall Superintendent

Do not write the Register Number, Roll Number, College Code and the Name in any other part of the Answer Book
Instruction to the Candidate. Put (✓) for the questions attended in the tick mark column against each question

					i					ii					iii					Total Marks	Grand Total			
Q	✓	C O	B T	Marks	Q	✓	C O	B T	Marks	✓	C O	B T	Marks	✓	C O	B T	Marks		CO 1	CO 2	CO 3	CO 4		
1					11		✓	1	12									12	12	13	14	15		
2																			CO 6	CO 7	CO 8	CO 9		
3					12																			
4				2																				
5					13																			
6				1																				
7					14		✓	4	10									10						
8				2																				
9					15		✓	5	12									12						
10																								
					16		✓	2	10									10						
Total				5	Total				45															

90%

Declaration by the Examiner: Verified that all the questions attended by the student are valued and the total is found to be correct

17.05.2023

Date of Valuation

R. DEEPAKUMAR

Name of the Examiner

17/5/23

Signature of the Examiner

NOTED

Statement of student stating all Comments/ Corrections noted

V. J.

Signature of the Candidate

CARE COLLEGE OF ENGINEERING
INTERNAL TEST PERFORMANCE ANALYSIS

EVEN SEMESTER 2022-2023 - II YEAR ECE (2021-2025) - SEMESTER-04

S.NO	REG NO	NAME	EC3401 - Networks & Security - Ms.R.Deepalakshmi					
			CT 1	CT 2	RETEST	Model 1	Model 2	
			100	100	100	100	100	
1	810721106001	ARASU C	60	AB	92	AB	25	
2	810721106002	AROCKIYA JAYARAJ S	58	AB	82	AB	34	
3	810721106003	CHARUKESI S	35	AB		18	35	
4	810721106004	DHARUNIKA M	77	AB		56	72	
5	810721106005	DIVYADHARSHINI G	80	AB		28	59	
6	810721106006	ESWARAMOORTHI M	50	AB	82	AB	32	
7	810721106007	HANISH K A	50	AB	88	AB	29	
8	810721106008	HELEN PRICILLA X	81	65		60	68	
9	810721106009	KAYAL VIZHIR	79	67		57	82	
10	810721106010	KOWSIKA S	66	AB	84	AB	28	
55	810721106011	MEGANATH V	66	47		53	50	
12	810721106012	V	65	64		45	71	
13	810721106013	REEGAN RUSOUL L	70	AB	88	AB	39	
14	810721106014	RIYAZ KHAN S	50	AB	82	AB	53	
15	810721106015	SAKTHIVEL N	61	53	86	AB	66	
16	810721106016	SAMRUTH SRIRAM D	90	AB	86	AB	50	
17	810721106017	SANTHOSH K	26	AB		AB	33	
18	810721106018	SIVAGANAPATHY R	35	AB		AB	38	
19	810721106019	SUBHIKSHA S	63	AB		25	50	
20	810721106020	SUDHARSAN R	68	52		43	57	
21	810721106021	SUJITHA R	50	53		50	57	

Dr. J. Jeyarani

Professor & Head

Department of ECE

CARE College of Engineering

Trichy - 620 009.

22	810721106022	SURIYAPRABU P	40	AB	AB	AB
23	810721106024	THARUNIKA M E	79	AB	42	52
24	810721106025	UMAMAGESHWARI K	78	60	63	AB
Total No. of Pass for 50						
Total Absentees			24	24	24	24
Pass Percentage % for 50			20	7	6	13
Mean of Marks			0	16	12	2
Total No. of Pass for 70			83.33	29.17	25	54.17
Pass Percentage % for 70			61.54	19.21	22.5	45
			33.33	0.00	0	12.5

Dr. J. Jeyarani

Professor & Head
Department of ECE
CARE College of Engineering
Trichy - 620 009.

Unit, Cycle Test and Model Exam (IA) failed students Root Cause Analysis

SUBJECT INFORMATION

PROGRAMME: Electronics and Communication Engineering	DEGREE: B.E.
COURSE: Networks and Security	SEMESTER: IV CREDITS: 04
COURSE CODE: EC3401 REGULATION: R 2021	COURSE TYPE: CORE
COURSE AREA/DOMAIN: Networks & Cryptography	CONTACT HOURS: 6 hours/Week.
TOTAL NO. OF STUDENTS: - 24	AVERAGE NO OF FAILED STUDENTS IN ALL EXAMS: 4

S.no	Problems raised by the students & faculty perspective	Remedies taken by the department
1	Some of the unit has vast syllabus	Minimal notes were given to learn the topics
2	Two marks they are not writing in test	Insisted the importance of two marks and started practice
3	Continuous test were given no time for revision	Revision schedule and extended timing for coaching is given by change in college timing
4	More programming and problems in some units	Given assignments and homeworks for their practice

Note:The above said remedies have been implemented and some additional tests were conducted. Based on the results analysis of the additional tests, it was noticed that the pass percentage has been enhanced. The evidence were attached in the criterion 1.1.1 & 1.1.2.



J. Jeyarani
Dr. J. JEYARANI
 Professor & Head
 Department of ECE
CARE College of Engineering
 Trichy - 620 009.

Department of Electronics and Communication Engineering

Course End Survey

Branch: ECE

Semester: IV Sem

Course Code & Name: EC3401 - Networks & Security

Faculty In-charge: Mrs.R.Deepalakshmi

Academic Year: 2022-23 EVEN

S. No.	Course Outcome	Excellent (3)	Good (2)	Satisfactory (1)	Assessed Marks
1	Design the Network Models and datalink layer functions	7			3
2	Analyze routing algorithms in the Network Layer.		7		2
3	Explore the methods of communication and congestion control by the Transport Layer.	7			3
4	Design and analyze Network Security Mechanisms.	7			3
5	Characterize the various hardware security attacks and their countermeasures.		7		2

Date: 25-5-2023

Department of Electronics and Communication Engineering

Course End Survey

Branch: ECE

Semester: IV Sem

Course Code & Name: EC3401 - Networks & Security

Faculty In-charge: Mrs.R.Deepalakshmi

Academic Year: 2022-23 EVEN

S. No.	Course Outcome	Excellent (3)	Good (2)	Satisfactory (1)	Assessed Marks
1	Design the Network Models and datalink layer functions	↗			3
2	Analyze routing algorithms in the Network Layer.	↗			3
3	Explore the methods of communication and congestion control by the Transport Layer.		↗		2
4	Design and analyze Network Security Mechanisms.		↗		2
5	Characterize the various hardware security attacks and their countermeasures.	↗			3

Date: 28-5-2023

Department of Electronics and Communication Engineering

Course End Survey

Branch: ECE

Semester: IV Sem

Course Code & Name: EC3401 - Networks & Security

Faculty In-charge: Mrs.R.Deepalakshmi

Academic Year: 2022-23 EVEN

S. No.	Course Outcome	Excellent (3)	Good (2)	Satisfactory (1)	Assessed Marks
1	Design the Network Models and datalink layer functions	✓			3
2	Analyze routing algorithms in the Network Layer.		✓		2
3	Explore the methods of communication and congestion control by the Transport Layer.	✓			3
4	Design and analyze Network Security Mechanisms.	✓			3
5	Characterize the various hardware security attacks and their countermeasures.	✓			3

Date: 25/5/23

Department of Electronics and Communication Engineering

Course End Survey

Branch: ECE

Semester: IV Sem

Course Code & Name: EC3401 - Networks & Security

Faculty In-charge: Mrs.R.Deepalakshmi

Academic Year: 2022-23 EVEN

S. No.	Course Outcome	Excellent (3)	Good (2)	Satisfactory (1)	Assessed Marks
1	Design the Network Models and datalink layer functions	✓			3
2	Analyze routing algorithms in the Network Layer.	✓			3
3	Explore the methods of communication and congestion control by the Transport Layer.	✓			3
4	Design and analyze Network Security Mechanisms.	✓			3
5	Characterize the various hardware security attacks and their countermeasures.	✓			3

Date: 25.5.2023

Department of Electronics and Communication Engineering

Course End Survey

Branch: ECE

Semester: IV Sem

Course Code & Name: EC3401 - Networks & Security

Faculty In-charge: Mrs.R.Deepalakshmi

Academic Year: 2022-23 EVEN

S. No.	Course Outcome	Excellent (3)	Good (2)	Satisfactory (1)	Assessed Marks
1	Design the Network Models and datalink layer functions	✓			3
2	Analyze routing algorithms in the Network Layer.	✓			3
3	Explore the methods of communication and congestion control by the Transport Layer.	✓			3
4	Design and analyze Network Security Mechanisms.	✓			3
5	Characterize the various hardware security attacks and their countermeasures.	✓			3

Date: 25/5/23

Department of Electronics and Communication Engineering

Course End Survey

Branch: ECE

Semester: IV Sem

Course Code & Name: EC3401 - Networks & Security

Faculty In-charge: Mrs.R.Deepalakshmi

Academic Year: 2022-23 EVEN

S. No.	Course Outcome	Excellent (3)	Good (2)	Satisfactory (1)	Assessed Marks
1	Design the Network Models and datalink layer functions	✓			3
2	Analyze routing algorithms in the Network Layer.	✓			3
3	Explore the methods of communication and congestion control by the Transport Layer.		✓		2
4	Design and analyze Network Security Mechanisms.		✓		2
5	Characterize the various hardware security attacks and their countermeasures.			✓	1

Date: 25/05/23

DEPARTMENT OF ECE

Faculty Name: Mr.B.Dasakrishnan		Semester: IV																									
Subject Code and Name: ECE401- Microelectronics and Assembly		Department: ECE																									
Academic Year: 2023-24		Semester: IV																									
S.No	Questions	Student 1	Student 2	Student 3	Student 4	Student 5	Student 6	Student 7	Student 8	Student 9	Student 10	Student 11	Student 12	Student 13	Student 14	Student 15	Student 16	Student 17	Student 18	Student 19	Student 20	Student 21	Student 22	Student 23	Student 24	Average	
1	Does the faculty ensure prepared on lecture?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5.0
2	Does the faculty present the lecture clearly and neatly?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5.0
3	Does the faculty speak with the voice clearly and effective body language?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5.0
4	Is the faculty capable of keeping the class under discipline and control?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5.0
5	Does the faculty commend students' attention and give responses to students' doubts and queries?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5.0
6	Does the faculty possess depth of knowledge to support?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5.0
7	Does the faculty allow students to give assignments. It improves the student?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5.0
8	Is the faculty available outside class hours to clarify doubts if requested to by students?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5.0
9	Does the faculty help the students to clear the doubts and guide them in the successful completion of the practical programme?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5.0
10	Does the faculty use the Black board effectively?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5.0
11	Is the faculty regular and punctual?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5.0
12	Does the faculty come with neat dress and punctual?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5.0
13	Does the faculty insist on keeping the benches up to date and neat?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5.0
14	Does the faculty take interest in monitoring discipline responses in the college premises?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5.0
15	Does the faculty attend you about your responsibility to the institution?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5.0
16	Do you find the faculty unbiased and open minded in judgment?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5.0
17	Do you find the faculty patient and cooperative?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5.0
18	Do you find the faculty impartial and honest in paper evaluation and practical remark making?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5.0
19	Do you find the faculty keeping in the class as well as outside?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5.0
20	Do you find in the faculty, a true friendly support with elderly students?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5.0

- The following points have been identified from the feedback given by the students about course:
1. Students expect faculty to take interest in maintaining discipline anywhere in the college premises.
 2. Students expect faculty to remind about their responsibilities to the institutions.

Remedial action :

1. I will invest them about their responsibilities in the college and will take interest in maintaining discipline in the college premises.



Dr. J. JEYARANI
Professor & Head
Department of ECE
CARE College of Engineering
Trichy - 620 009.

CARE

COLLEGE OF ENGINEERING

(Approved by AICTE and Affiliated to Anna University, Chennai)
27, Thayanur, Trichy – 620009

ANALYSIS OF UNIVERSITY QUESTION PAPER

Degree: B.E Branch: ECE Year: II Semester: IV

Academic year: 20 Batch: 2021-2025

Students Admitted During the Year: 24

Subject Code with Name: EC3401 - Networks & Security

University Examination Date: 15.06.2023 & FN

Name of the Faculty: Mrs. R. Deepalakshmi

Designation: AP

Department: ECE

1	Are the questions Easy/Difficult/Moderate?	<u>Easy</u>
2	Is the Question Paper Theoretical/ Analytical?	<u>Theoretical</u>
3	Does the Question Paper covers all the Unit?	<u>Yes</u>
4	Is the Question paper Lengthy/Finishable in time?	<u>Lengthy</u>
5	Are all the questions equally distributed (Units)?	<u>Yes</u>
6	Are all the Questions given proper weight-age of Marks?	<u>Yes</u>
7	Mention the question numbers which given in Internal Assessments.	<u>1,2,3,4,5,6,7,8,9,10,11,12,13,14,15</u>
8	Mention the question numbers which given in Previous University Question Papers.	<u>Except part C</u>
9	Mention the question numbers which are out of syllabus in PART A	<u>NIL</u>
10	Mention the question numbers which are out of syllabus in PART B	<u>NIL</u>
11	Mention the question numbers which are out of syllabus in PART C	<u>NIL</u>
12	Mention the question numbers which are covered in Text Book	<u>All Questions</u>
13	Mention the question numbers which has data loss/missing to solve the problem	<u>NIL</u>

14	Mention the question numbers which are covered in Reference Book	All Questions
15	Mention the question numbers which are covered in Local Author Book	All Questions
16	Mention the question numbers which are covered in Text/Reference/ local Author Books	All QP's Except Part C
17	What is Expected Pass Percentage?	83.3%
18	Number and % of Expected Failures	04 B 17%
19	Is Moderation required? (Yes/No)	NO
20	Have you send the letter to the controller of examinations through the Principal for any discrepancy in the Question Paper? (If Yes attach herewith the copy of the letter)	NO
21	Have you attached the copy of the University Question Paper herewith/ (Yes/No)	Yes
22	Any Other Comments	—
23	Candidates Feedback (Best 3 students, average 3 students, below average 3 students, any one)	

S. No.	Register No.	Name of the Candidate	Question paper Feed Back (easy/Moderate/Difficult)	Signature of the Candidate
1	810721106020	Sudhasan.R	Easy.	Sudhasan.R
2	80721106015	N SARTHANL	Easy	N SARTHANL
3	810721106018	Siva rananay	easy	Siva
4	810721106009	KAVAJ VIKHI.R	Easy	Kavaj.R
5	810721106012	NOVA AROCKIA RAJ.V	Easy	Nova.V
6	810721106004	DHARUNIKA.M	Easy	Dharunika.M
7	810721106017	SANTHOSH.K	Easy	Santhosh.k
8	810721106024	THARUNIKA.M.E	Easy	Tharunika.M.E
9	810721106021	SWITHA.R	Easy.	Switha.R

Faculty Signature with Date
15/6/23

HOD Signature with Date
J. J. Mani 15/6/23

PRINCIPAL Signature with Date
S. Mani 15.6.23

Note:

- 1) As soon as the Examination is over, duly fill all the details in the above proforma and the original copy should be submitted in person by the faculty to the Principal.
- 2) One Xerox Copy should be submitted to the HOD and another copy to be filled in the course file.

Feedback by faculty in-charge on the handled course

From

Ms.R.Deepalakshmi,
Assistant Professor,
Department of ECE,
CARE College of Engineering,
Trichy-620009

To

The Principal,
CARE College of Engineering,
Trichy-620009

Through The Head of the Department, ECE

Respected Madam,

Sub: My Feedback on EC3401 Networks and Security, Fourth semester, AY 2022-23 for forthcoming academic year.

- It is herewith brought to your kind attention that I have handled EC3401 Networks and Security, Fourth semester 2021 - 2025 batch in the Academic year 2022-23 Even Semester. In this regard, I wish to convey my feed back to the forthcoming academic year as follows:
- This subject consists of 60% Theory, 20% Algorithms and 20% Problems. Hence, I have shared many video tutorials in connection with the subject as it is laboratory oriented also.
- The subject includes more theory networking concepts so I gave many assignments topics to understand the theory concepts.
- The subject is related to laboratory so most units are related with the practical concepts.

Suggestion to the forthcoming semesters:

- Many networking concepts have been studied from a theoretical perspective, but they have been missed from a practical standpoint. If possible, these methods will be implemented into upcoming semester laboratories to improve student's better understanding.

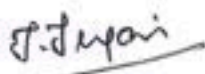
Thanking you,



Yours Sincerely,

Place: Trichy
Date: 25.05.2023

(R.Deepalakshmi)

Forwarded to Principal


25/5/23


2.6.23

PRINCIPAL
CARE COLLEGE OF ENGINEERING
No. 27, Thayanur, Trichy-620 009.

Reg. No. :

8	1	0	7	2	1	1	0	6	0	2	0
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Question Paper Code : 30141

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023.

Fourth Semester

Electronics and Communication Engineering

EC 3401 – NETWORKS AND SECURITY

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State the purpose of layering in networks.
2. List out the issue in data link layer.
3. Compare inter domain and intra domain routing protocols.
4. Give an IPv6 datagram format.
5. What are the advantages of using UDP over TCP?
6. What are the techniques to improve QoS?
7. What are the types of attacks on encrypted message?
8. Define weak collision property of a hash function.
9. What are the types of hardware Trojans?
10. What is KYC in blockchain?

PART B — (5 × 13 = 65 marks)

11. (a) Explain in detail about TCP/IP network models.

Or

- (b) Describe the basic concepts of error detection and error correction.

12. (a) Summarize the basic principles of network protocols.

Or

(b) Discuss in detail about transition from IPv4 and IPv6.

13. (a) Illustrate the basic concepts of congestion control and avoidance.

Or

(b) Explain in detail about client-server programming.

14. (a) Draw an OSI security architecture and explain in detail.

Or

(b) Write a detailed notes on RSA algorithm.

15. (a) Discuss in detail about hardware security.

Or

(b) Describe the basic principles of channel attacks.

PART C — (1 × 15 = 15 marks)

16. (a) Is it possible to design and implement a protocol format which suits for both IPv4 and IPv6. How do you proceed with? What are the technical challenges and assumptions you have to make? How this adapts to both the versions, in case an application demands. Is there any such systems you come across? Why they have not been recommended or recommended. In both the cases, give proper justifications.

Or

(b) How hardware attacks such as channel and Physical attacks on network components disturbs the network performance. Suggest and comment on that if such systems are replaced with wireless scenario, can these problems on network performance be solved. If so, why people are still use lot of hardware components for laying the networks. What are the different possible arguments and solutions for the posed situations?

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27.Thayanur, Trichy-620 009

LAB COURSE FILE

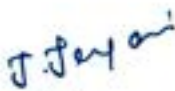
EC3401 NETWORKS AND SECURITY (INTEGRATED LAB)

Academic Year: (2022-2023) EVEN

Faculty Name : Mrs. R.DEEPALAKSHMI,AP/ECE

S.No.	PARTICULARS	REMARKS
1	SYLLABUS	YES
2	LAB MANUAL	YES
3	SAMPLE REORD	YES
4	MODEL LAB QUESTION PAPER AND ANSWER SHEET	YES
5	CO PO ATTAINMENT SHEET	\
6	COURSE END SURVEY	YES


Staff In-charge


HOD

Dr. J. JEYARANI
Professor & Head
Department of ECE
CARE College of Engineering
Trichy - 620 009.


PRINCIPAL
CARE COLLEGE OF ENGINEERING
No. 27, Thayanur, Trichy-620 009.

EC3401 NETWORKS AND SECURITY (INTEGRATED LAB)

PRACTICAL EXERCISES:

30 PERIODS

Experiments using C

1. Implement the Data Link Layer framing methods,
 - i) Bit stuffing, (ii) Character stuffing
2. Implementation of Error Detection / Correction Techniques
 - i) LRC, (ii) CRC, (iii) Hamming code
3. Implementation of Stop and Wait, and Sliding Window Protocols
4. Implementation of Go back-N and Selective Repeat Protocols.
5. Implementation of Distance Vector Routing algorithm (Routing Information Protocol) (Bellman-Ford).
6. Implementation of Link State Routing algorithm (Open Shortest Path First) with 5 nodes (Dijkstra's).
7. Data encryption and decryption using Data Encryption Standard algorithm.
8. Data encryption and decryption using RSA (Rivest, Shamir and Adleman) algorithm.
9. Implement Client Server model using FTP protocol.

Experiments using Tool Command Language

1. Implement and realize the Network Topology - Star, Bus and Ring using NS2.
2. Implement and perform the operation of CSMA/CD and CSMA/CA using NS2.

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DEPARTMENT OF ECE

EC3401-NETWORKS & SECURITY INTEGRATED LAB

SEM /YEAR:IV/II

DATE:11.05.2023&F.N

1. Implement the Data Link Layer framing methods using C
i) Bit stuffing (ii) Character stuffing (100)
2. Implementation of Error Detection / Correction Techniques using C
i) LRC, (ii) CRC, (iii) Hamming code (100)
3. Implementation of Stop and Wait Protocols using C. (100)
4. Implementation of Sliding Window Protocols using C. (100)
5. Implementation of Go back-N and Selective Repeat Protocols using C (100)
6. Implementation of Distance Vector Routing algorithm (Routing Information Protocol) (Bellman-Ford) using C (100)
7. Implementation of Link State Routing algorithm (Open Shortest Path First) with 5 nodes (Dijkstra's) using C (100)
8. Data encryption and decryption using Data Encryption Standard algorithm using C (100)
9. Data encryption and decryption using RSA (Rivest, Shamir and Adleman) algorithm using C (100)
10. Implement Client Server model using FTP protocol using C (100)
11. Implement and realize the Network Topology - Star, Bus and Ring using NS2. (100)
12. Implement and perform the operation of CSMA/CD and CSMA/CA using NS2. (100)

J. Jeyarani
HOD 10/5/23

Dr. J. JEYARANI

Professor & Head

Department of ECE

CARE College of Engineering

Trichy, - 620 009.

INTERNAL EXAMINER

EC3101 - NETWORKS & SECURITY
MODEL LAB

DATE: 11.05.2023 SEN

S.NO	REGISTER NO	NAME OF THE STUDENT	SIGNATURE
1	810721106001	ARASHI C	Arashi C
2	810721106002	S AROCKIA JAYARAJ	S. Arckia Jayaraj
3	810721106003	S. Choukani	S. Choukani
4	810721106004	Sharanika . M	Sharanika . M
5	810721106005	Dinyathashini	Dinyathashini
6	810721106006	Esuvaranarathi . M	Esuvaranarathi . M
7	810721106007	Hanish . X . A	Hanish . X . A
8	810721106008	Helen Pricilla . X	Helen Pricilla . X
9	810721106009	KAVAL VIZHI . R	Kaval Vizhi . R
10	810721106010	Kowsika . S	Kowsika . S
11	810721106011	MEGANATH . V	Meganath . V
12	810721106012	NOVA AROCKIA RAJ . V	Nova Arockia Raj . V
13	810721106013	REEGAN RUSOUL . L	Reegan Rusoul . L
14	810721106014	RIYAZ KHAN . S	Riyaz Khan . S
15	810721106015	SAKTHINEL . N	Sakthinel . N
16	810721106016	SAMRUTH SRIRAM . D	Samruth Sriram . D
17	810721106017	SANTHOSH . K	Santhosh . K
18	810721106018	Siva gan aram	Siva gan aram
19	810721106019	Subhiksha . S	Subhiksha . S
20	810721106020	Sudhansan . R	Sudhansan . R
21	810721106021	Sujitha . R	Sujitha . R
22	810721106022	Suthiya Pratheep	Suthiya Pratheep
23	810721106024	H S sharanika	H S sharanika
24	810721106025	Je Unnamogalvarani	Je Unnamogalvarani

J. J. J.

11/05/2023

~~11/5/23~~

EC3401 - Network & Security Lab

Year/Sem : II / IV

DATE & SESSION 11.05.2023 8PM

Reg. No : 810721106020

NAME SUDHARSAN P.

MARK ALLOCATION

S.NO	Description	MARKS ALLOTTED	MARKS OBTAINED
1.	Aim apparatus examined	15	15
2.	program / Algorithm	35	35
3.	Execution / procedure	20	20
4.	Result	10	10
5.	Record	10	10
6.	viva - voce	10	01
	Total	100	91

~~11/5/23~~

Internal Examiner.

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INTERNAL TEST PERFORMANCE ANALYSIS
EVEN SEMESTER 2022-2023 - II YEAR ECE - SEMESTER-04

<u>S.NO</u>	<u>REG NO</u>	<u>NAME</u>	EC3401 - Networks & Security laboratory - Ms.R.Deepalakshmi
			100
1	810721106001	ARASU C	87
2	810721106002	AROCKIYA JAYARAJ S	82
3	810721106003	CHARUKESI S	90
4	810721106004	DHARUNIKA M	94
5	810721106005	DIVYADHARSHINI G	98
6	810721106006	ESWARAMOORTHIM	84
7	810721106007	HANISH K A	92
8	810721106008	HELEN PRICILLA X	95
9	810721106009	KAYAL VIZHI R	97
10	810721106010	KOWSIKA S	89
11	810721106011	MEGANATH V	95
12	810721106012	<i>Mala Anakha Raj. V</i>	94
13	810721106013	REEGAN RUSOUL L	92
14	810721106014	RIYAZ KHAN S	83
15	810721106015	SAKTHIVEL N	97
16	810721106016	SAMRUTH SRIRAM D	98
17	810721106017	SANTHOSH K	81
18	810721106018	SIVAGANAPATHY R	80
19	810721106019	SUBHIKSHA S	88
20	810721106020	SUDHARSAN R	91
21	810721106021	SUJITHA R	92
22	810721106022	SURIYAPRABU P	82
23	810721106024	THARUNIKA M E	98
24	810721106025	UMAMAGESHWARI K	93



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LAB MANUAL


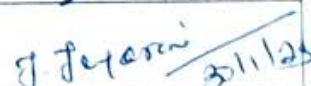
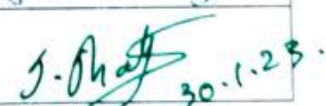
EC3401- NETWORKS AND SECURITY LABORATORY

YEAR / SEMESTER : II / IV

SUBJECT CODE : EC3401

SUBJECT : NETWORKS AND SECURITY LABORATORY

REGULATION : 2021

	Name	Signature
Prepared by	Mrs.R.Deepalakshmi/AP - ECE	 30/1/2023
Verified by	Dr.J.Jeyarani/ HoD - ECE	 30/1/23
Approved by	Dr.S.Shanthi / Director	 30.1.23.