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INSTITUTE OF AERONAUTICAL ENGINEERING (Autonomous)

MODEL QUESTION PAPER - II

B.Tech IV Semester End Examinations (Regular), November – 2019

Regulation: IARE–R16 COMPUTER NETWORKS (ECE)

Time:3Hours

Max Marks:70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT-I

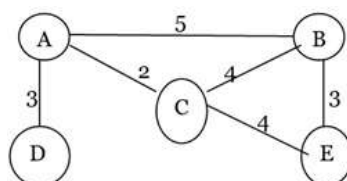
- 1 a. With neat sketch, illustrate in detail the architecture of OSI layer model. 7M
- b. If a periodic signal is decomposed into five sine waves with frequencies of 100, 300, 500, 700, and 900 Hz, what is its bandwidth? 7M
- 2 a. Differentiate four basic topologies? Elucidate the network switching in detail with its types. 7M
- b. State transmission medium. Illustrate the guided and unguided transmission media in detail. 7M

UNIT-II

- 3 a. Discuss the various types of Data Link Protocols and explain HDLC. 7M
- b. Given the data word 1010011110 and the divisor 10111, show the generation of code word at the sender side and checking of code word at the receiver side. 7M
- 4 a. Illustrate the random access control and controlled access protocols in detail. Express the looping problem and its solution. 7M
- b. Calculate the hamming distance for each of the following code words? 7M
 - i. d(10000,01000)
 - ii. d(10101, 10010)
 - iii. d(1111,1111)
 - iv. d(0000,0000)

UNIT-III

- 5 a. How messages can be exchanged via Border Gateway Protocol (BGP) and explain about the BGP packet format. 7M
- b. Illustrate the Dijkstra algorithm and find the shortest for the network shown in Figure. 7M



- 6 a. How different network protocols can be connected using tunneling with neat diagram. 7M
- b. List the three variants of the internetworking. Differentiate transparent and non-transparent fragmentation. 7M

UNIT-IV

- 7 a. Draw and explain each field in TCP connection management finite state machine with neat diagram. 7M
- b. A 3000 km long trunk operates at 1.536 Mbps and is used to transmit 64 byte frames and uses sliding window protocol. If the propagation speed is 6 sec / km, how many bits should the sequence number field be? 7M
- 8 a. Compare and analyze the performance of TCP and UDP. 7M
- b. Draw UDP header format. What are the fields in UDP header and analyze the necessity of each field. 7M

UNIT-V

- 9 a. Illustrate the use of MIME Extension. Analyze the reasons to add Message headers by MIME in detail. 7M
- b. Analyze the functionalities of telnet and SSH. State advantages of stateless server of HTTP? 7M
- 10 a. What is DNS? Compare and contrast client/server with peer-to-peer data. 7M
- b. Show the sequence of bits sent from a client TELNET for the binary transmission of 1111001100111100 11111111 7M



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COURSE OBJECTIVES:

The course should enable the students to:

I.	Recognize modern network architectures from a design and performance perspective.
II.	Understand the basics and challenges of network communication.
III.	Provide an opportunity to do network programming using TCP/IP.
IV.	Interpret the operation of the protocols that are used inside the Internet.

COURSE LEARNING OUTCOMES:

Students, who complete the course, will have demonstrated the ability to do the following:

Sl. No	Course Learning Outcomes
AIT003.01	Understand the importance of data networks and the Internet in supporting business Communications and everyday activities.
AIT003.02	Classify different network topologies, LANs, WANs, internetworks and models such as Open System Interconnect (OSI), TCP/IP.
AIT003.03	Understand the significance and purpose of protocols, standards and their key elements use in data Communications and networking.
AIT003.04	Describe the relationship between data and signals, their types, behavior, properties, Characterization and transmission in the physical layer.
AIT003.05	Understand the basic concepts of data communications including the key aspects of networking and their interrelationship, packet switching, circuit switching as internal external operations, physical structures, types, models and internetworking.
AIT003.06	Understand the concept, advantages, analysis of cyclic codes including their algebraic representation and explain the design, implementation, performance of cyclic redundancy check, checksum.
AIT003.07	Understand the basic difference between data logical link control, media access control and discuss logical link control with reference to framing, flow and error control.
AIT003.08	Describe the reliable inter-node transmission of frames and discuss the ability to compare and contrast high-level data link control protocol and point-to-point protocol (HDLC, PPP).
AIT003.09	Understand connecting LAN's, backbone networks, and virtual LAN's and operations of bridges, Spanning tree algorithm in networks.
AIT003.10	Explain the role of data link layer protocols in data transmission and the preparation method of Data for transmission on network media.
AIT003.11	Understand routing principles and algorithms such as distance vector and link state and usage of the routing protocols on the Internet such as RIP, OSPF, and BGP.
AIT003.12	Understand internetworking principles and the operation of Internet protocols IP, IPv4, IPv6 and ICMP.
AIT003.13	Explain and demonstrate the mechanics associated with IP addressing, device interface, association between physical and logical addressing.
AIT003.14	Understand the concepts of transport service, elements of transport protocol and congestion Control in the computer networks.
AIT003.15	Describe the utilization of transport layer protocols in the control congestion on the Internet.
AIT003.16	Analyze the correct transport layer protocol, such as TCP and UDP to transfer data segments in the networks.
AIT003.17	Describe the SCTP, RTP protocols and analyze the applications based on these protocols, network activity at the transport layer.
AIT003.18	Analyze the operations and features of common application layer protocols such as Hyper Text Transfer protocol (HTTP), File transfer Protocol (FTP.)
AIT003.19	Describe the operations and features of common application layer protocols such as Dynamic Host

	Configuration Protocol (DHCP), Simple Mail Transfer Protocol (SMTP).
AIT003.20	Describe SSH-based applications, socket programming and its role in application processing.
AIT003.21	Analyze the process of map hostnames to IP addresses using Domain Naming System (DNS) protocol.
AIT003.22	Understand the concepts of E-mail, telnet, secure shell in computer networks.
AIT003.23	Possess the knowledge and skills for employability and to succeed in national and international level competitive examinations.
AIT003.24	Possess the knowledge and skills currently use in the Internet work and the requirements for designing network protocols.

Mapping of Semester End Examination to Course Learning Outcomes:

SEE Question No.	Course Learning Outcomes		Blooms Taxonomy Level
1	a	AIT003.01 Understand the importance of data networks and the Internet in supporting business communications and everyday activities.	Understand
	b	AIT003.04 Describe the relationship between data and signals, their types, behavior, properties, characterization and transmission in the physical layer.	Remember
2	a	AIT003.05 Understand the basic concepts of data communications including the key aspects of networking and their interrelationship, packet switching, circuit switching as internal external operations, physical structures, types, models and internetworking.	Understand
	b	AIT003.04 Describe the relationship between data and signals, their types, behavior, properties, characterization and transmission in the physical layer.	Remember
3	a	AIT003.07 Understand the basic difference between data logical link control, media access control and discuss logical link control with reference to framing, flow and error control.	Understand
	b	AIT003.07 Understand the basic difference between data logical link control, media access control and discuss logical link control with reference to framing, flow and error control.	Understand
4	a	AIT003.09 Understand connecting LAN's, backbone networks, and virtual LAN's and operations of bridges, spanning tree algorithm in networks.	Understand
	b	AIT003.07 Understand the basic difference between data logical link control, media access control and discuss logical link control with reference to framing, flow and error control.	Understand
5	a	AIT003.12 Understand internetworking principles and the operation of Internet protocols IP, IPv4, IPv6 and ICMP.	Understand
	b	AIT003.13 Explain and demonstrate the mechanics associated with IP addressing, device interface, association between physical and logical addressing.	Remember
6	a	AIT003.12 Understand internetworking principles and the operation of Internet protocols IP, IPv4, IPv6 and ICMP.	Understand
	b	AIT003.12 Understand internetworking principles and the operation of Internet protocols IP, IPv4, IPv6 and ICMP.	Understand
7	a	AIT003.14 Understand the concepts of transport service, elements of transport protocol and congestion control in the computer networks.	Remember
	b	AIT003.15 Describe the utilization of transport layer protocols in the control congestion on the Internet.	Remember
8	a	AIT003.16 Analyze the correct transport layer protocol, such as TCP and UDP to transfer data segments in the networks.	Analyzing
	b	AIT003.16 Analyze the correct transport layer protocol, such as TCP and UDP to transfer data segments in the networks.	Analyzing

9	a	AIT003.21	Analyze the process of map hostnames to IP addresses using Domain Naming System (DNS) protocol.	Analyzing
	b	AIT003.21	Analyze the process of map hostnames to IP addresses using Domain Naming System (DNS) protocol.	Analyzing
10	a	AIT003.19	Describe the operations and features of common application layer protocols such as Dynamic Host Configuration Protocol (DHCP), Simple Network Management (SNMP).	Understand
	b	AIT003.18	Analyze the operations and features of common application layer protocols such as Hyper Text Transfer protocol (HTTP), File transfer Protocol (FTP.)	Analyzing

HOD, ECE