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Question Paper Code: AIT003



INSTITUTE OF AERONAUTICAL ENGINEERING (Autonomous)

MODEL QUESTION PAPER - I

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. Explain ISO/OSI Modes with neat diagram? 7M
b. Imagine a signal travels through a transmission medium and its power is reduced to half. This means $p_2 = (1/2) p_1$. Calculate Attenuation. 7M
2. a. Discuss and differentiate between Circuit switching and packet switching Network? 7M
b. Consider the difference between circuit switching and packet switching. Assume the link's rate is 2 Mbps and users are generating data at a rate of 100 Kbps when busy. Users are busy only %1 of time. 7M
a. What is the maximum number of users that a circuit switching architecture can Support simultaneously?

UNIT-II

- 3 a. Explain the frame format, operation and ring maintenance feature of IEEE 802.3 MAC protocol? 7M
b. One hundred stations on a pure ALOHA network share a 1- Mbps channel. If Frames are 1000 bits long, find the throughput if each station is sending 10 frames/sec? 7M
- 4 a. Explain in details about the types learning and spanning tree bridges? 7M
b. A network with one primary and four secondary stations uses polling. The size of a data frame is 1000 bytes. The size of the poll, ACK, and NAK frames are 32 bytes each. Each station has 5 frames to send. How many total bytes are exchanged if there is no limitation on the number of frames a station can send in response to a Poll? 7M

UNIT-III

- 5 a. Explain internet protocol with the neat block diagram of IP header? 7M

- b. Consider a host using leaky bucket strategy for traffic shaping. The host sends a burst data at a rate of 15Mbps for first 3 seconds and remains silent for 2 seconds. Then again a burst data at a rate of 6 Mbps is send for next 2 seconds and then the Host remains silent for next 2 seconds. Now again the host sends data at rate of 5
7M
- 6 a. Mbps for next 3 seconds. What will be the output data rate of the leaky bucket?
How does IPv6 solve the problem of IPV4 address exhaustion?
7M
- b. A router with IPV4 address 123.45.21.12 and Ethernet physical address 23:45:BA: 00:67: CD has received a packet for a host destination with IP address 124.10.78.10.Show the entries in the ARP request packet sent by the router. Assume no sub-netting?
7M

UNIT-IV

- 7 a. Explain congestion avoidance techniques in detail?
A TCP connection is using a window size of 12000 bytes and the previous acknowledgement number was22001. It receives a segment with acknowledgment number 24001 and window size advertisement of 12000. Design diagram to show The situation of the window before and after?
7M
- b. 7M
- 8 a. Explain the TCP Connection establishment and termination using Timeline Diagram?
7M
- b. Assume each packet has typical TCP and IP headers each 20bytes long. If we have three computers, A, B and C. The link between A and B has an MTU of 3000 bytes, while the link between B and C has an MTU of 1000 bytes. Consider the case where a packet needs to be sent from A to C that has a size of 3000 bytes (including headers). How many fragments will we have from B to C, and how much data will be in each fragment (i.e. excluding headers)? (all connections are assumed to be Ethernet)
7M

UNIT-V

- 9 a. Describe the role of the local name server and the authoritative name server in DNS?
7M
- b. Determine which of the following an FQDN is and which is a PQDN?
7M
- i. Mil
- ii. Edu
- iii. xxx.yyy.net
- 10 a. Explain in detail about the working principles of Simple Network Management Protocol (SNMP).
7M
- b. Explain the working principle of FTP in detail with neat diagram?
7M



INSTITUTE OF AERONAUTICAL ENGINEERING (Autonomous)

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
CAIT003.01	Understand the importance of data networks and the Internet in supporting business Communications and everyday activities.
CAIT003.02	Classify different network topologies, LANs, WANs, internetworks and models such as Open System Interconnect (OSI), TCP/IP.
CAIT003.03	Understand the significance and purpose of protocols, standards and their key elements use in data Communications and networking.
CAIT003.04	Describe the relationship between data and signals, their types, behavior, properties, Characterization and transmission in the physical layer.
CAIT003.05	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.
CAIT003.06	Understand the concept, advantages, analysis of cyclic codes including their algebraic representation and explain the design, implementation, performance of cyclic redundancy check, checksum.
CAIT003.07	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.
CAIT003.08	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).
CAIT003.09	Understand connecting LAN's, backbone networks, and virtual LAN's and operations of bridges, Spanning tree algorithm in networks.
CAIT003.10	Explain the role of data link layer protocols in data transmission and the preparation method of Data for transmission on network media.
CAIT003.11	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.
CAIT003.12	Understand internetworking principles and the operation of Internet protocols IP, IPv4, IPv6 and ICMP.
CAIT003.13	Explain and demonstrate the mechanics associated with IP addressing, device interface, association between physical and logical addressing.
CAIT003.14	Understand the concepts of transport service, elements of transport protocol and congestion Control in the computer networks.
CAIT003.15	Describe the utilization of transport layer protocols in the control congestion on the Internet.
CAIT003.16	Analyze the correct transport layer protocol, such as TCP and UDP to transfer data segments in the networks.
CAIT003.17	Describe the SCTP, RTP protocols and analyze the applications based on these protocols, network activity at the transport layer.
CAIT003.18	Analyze the operations and features of common application layer protocols such as Hyper Text Transfer protocol (HTTP), File transfer Protocol (FTP.)
CAIT003.19	Describe the operations and features of common application layer protocols such as Dynamic Host

	Configuration Protocol (DHCP), Simple Mail Transfer Protocol (SMTP).
CAIT003.20	Describe SSH-based applications, socket programming and its role in application processing.
CAIT003.21	Analyze the process of map hostnames to IP addresses using Domain Naming System (DNS) protocol.
CAIT003.22	Understand the concepts of E-mail, telnet, secure shell in computer networks.
CAIT003.23	Possess the knowledge and skills for employability and to succeed in national and international level competitive examinations.
CAIT003.24	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	CAIT003.01 Understand the importance of data networks and the Internet in supporting business communications and everyday activities.	Understand
	b	CAIT003.04 Describe the relationship between data and signals, their types, behavior, properties, characterization and transmission in the physical layer.	Remember
2	a	CAIT003.05 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	CAIT003.04 Describe the relationship between data and signals, their types, behavior, properties, characterization and transmission in the physical layer.	Remember
3	a	CAIT003.07 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	CAIT003.07 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	CAIT003.09 Understand connecting LAN's, backbone networks, and virtual LAN's and operations of bridges, spanning tree algorithm in networks.	Understand
	b	CAIT003.07 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	CAIT003.12 Understand internetworking principles and the operation of Internet protocols IP, IPv4, IPv6 and ICMP.	Understand
	b	CAIT003.13 Explain and demonstrate the mechanics associated with IP addressing, device interface, association between physical and logical addressing.	Remember
6	a	CAIT003.12 Understand internetworking principles and the operation of Internet protocols IP, IPv4, IPv6 and ICMP.	Understand
	b	CAIT003.12 Understand internetworking principles and the operation of Internet protocols IP, IPv4, IPv6 and ICMP.	Understand
7	a	CAIT003.14 Understand the concepts of transport service, elements of transport protocol and congestion control in the computer networks.	Remember
	b	CAIT003.15 Describe the utilization of transport layer protocols in the control congestion on the Internet.	Remember
8	a	CAIT003.16 Analyze the correct transport layer protocol, such as TCP and UDP to transfer data segments in the networks.	Analyzing
	b	CAIT003.16 Analyze the correct transport layer protocol, such as TCP and UDP to transfer data segments in the networks.	Analyzing

9	a	CAIT003.21	Analyze the process of map hostnames to IP addresses using Domain Naming System (DNS) protocol.	Analyzing
	b	CAIT003.21	Analyze the process of map hostnames to IP addresses using Domain Naming System (DNS) protocol.	Analyzing
10	a	CAIT003.19	Describe the operations and features of common application layer protocols such as Dynamic Host Configuration Protocol (DHCP), Simple Network Management (SNMP).	Understand
	b	CAIT003.18	Analyze the operations and features of common application layer protocols such as Hyper Text Transfer protocol (HTTP), File transfer Protocol (FTP.)	Analyzing

HOD, ECE