COMPUTER NETWORKS (ECEN 3132)

Time Allotted : 3 hrs

Full Marks: 70

 $10 \times 1 = 10$

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and <u>any 5 (five)</u> from Group B to E, taking <u>at least one</u> from each group.

Candidates are required to give answer in their own words as far as practicable.

Group – A (Multiple Choice Type Questions)

1. Choose the correct alternative for the fe	ollowing:
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- Which one of the following task is not done by data link layer?
 (a) Framing
 (b) Error control
 (c) Flow control
 (d) Channel coding.
- (ii) TCP/IP model does not have ____ layer but OSI model have this layer.
 (a) session layer
 (b) presentation layer
 (c) application layer
 (d) both (a) and (b)

(iii) What are the uses of subnetting?

- (a) It divides one large network into several smaller ones
- (b) It divides network into network classes
- (c) It speeds up the speed of network
- (d) None of above.

(iv) What is the minimum header size of an IP packet? (a) 16 bytes (b) 10 bytes (c) 20 bytes (d) 32 bytes.

- (v) Routing tables of a router keeps track of
 - (a) MAC Address Assignments
 - (b) Port Assignments to network devices
 - (c) Distribute IP address to network devices
 - (d) Routes to use for forwarding data to its destination.

(vi) What is the size of Host bits in Class B of IP address? (a) 04 (b) 08 (c) 16 (d) 32.

- (vii) A set of rules that govern all aspects of information communication is called
 (a) Server
 (b) Internet
 (c) Protocol
 (d) OSI Model.
- (viii) Transport layer protocols deals with(a) application to application communication

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- (b) process to process communication
- (c) node to node communication
- (d) none of the mentioned.
- (ix) What is the header size of UDP packet? (a) 8 bytes (b) 8 bits (c) 16 bytes

(d) 124 bytes.

(x) Application layer offers _____ service
(a) End to end
(c) Both of the mentioned

(b) Process to process(d) None of the mentioned.

Group – B

- 2. (a) Briefly explain the OSI Model. [(CO1) (Remember/LOCQ)]
 - (b) Illustrate the three criteria necessary for an effective and efficient network. [(CO1) (Understand/LOCQ)]
 - (c) Outline the utility of layered network architecture. [(CO1)(Analyze/IOCQ)]

6 + 4 + 2 = 12

- 3. (a) What do you mean by Network Topology? Illustrate the four basic Network Topology. [(CO2)(Understand/LOCQ)]
 - (b) Differentiate a port address, a logical address, and a physical address. [(CO2)(Analyze/IOCQ)]
 - (c) Reflect on the differences between OSI and TCP/IP model? [CO2, (Analyse, IOCQ)]

5 + 4 + 3 = 12

Group – C

- 4. (a) What are the differences between pure ALOHA and Slotted AHOLA? Comment on the utility part of the benefitting protocol with your own arguments. [CO3, (Analyse/IOCQ)]
 - (b) A group of N stations share 100 Kbps slotted ALOHA channel. Each station output a 500 bits frame on an average of 5000 ms even if previous one has not been sent. What is the required value of N? [CO3, (Evaluate/HOCQ)]

6 + 6 = 12

- 5. (a) Differentiate a single-bit error from a burst error. Discuss the concept of redundancy in error detection and correction. [(CO2) (Analyze/IOCQ)]
 - (b) A 4-bit data block 0111 is to be sent using the hamming code for error detection and correction. Show how the receiver detect and corrects an error that occurs in 3rd bit position from the right. [(CO3) (Evaluate/HOCQ)]
 - (c) Define framing and provide reasons for its need. [(CO3)(Analyze/IOCQ)]

3 + 6 + 3 = 12

Group – D

- 6. (a) Define the mask in IPv4 addressing? In case of IPv4 addressing find out the default mask value. [(CO4)(Evaluate/HOCQ)]
 - (b) Define sub-netting. Find out the difference between a subnet mask and a default mask in classful addressing? [(CO4) [Analyse/IOCQ]]
 - (c) Discuss the mechanism by which Address Resolution Protocol (ARP) find a physical address from a logical address. [(CO4,6)(Evaluate/HOCQ)]

2 + 4 + 6 = 12

- 7. (a) Analyse the connection termination process in TCP in using three-way handshaking. [(CO4) (Analyze/IOCQ)]
 - (b) Explain the working of the leaky bucket algorithm. [(CO4) (Remember/LOCQ)]
 - (c) Find the net-id and the host-id of the following IP addresses:
 (i) 24.64.255.65
 (ii) 195.44.80.21 [(CO4, 6)(Evaluate/HOCQ)]

6 + 4 + 2 = 12

Group – E

- 8. (a) Implement the DES algorithm to encrypt a 8 bit message. [(C05) (Analyze/IOCQ)]
 - (b) Compare and contrast the Asymmetric key and Symmetric key cryptography algorithms. [(CO5) (Analyze/IOCQ)]
 - (c) Design a digital signature technique with integrity, authentication, and non-repudiation. [(CO5,6)(Create/HOCQ)]

6 + 3 + 3 = 12

- 9. (a) Illustrate the IEEE 802.11. [(CO6) (Understand/LOCQ)]
 - (b) What is the purpose of FTP? Compare and contrast the functions of the two FTP connections. [(CO6) (Analyze/IOCQ)]
 - (c) Encrypt "INTRANET" using a transposition cipher with the following key: 35214
 - 12345 [(CO6)(Create/HOCQ)]

4 + 4 + 4 = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	23.96%	45.83%	30.21%

Course Outcome (CO):

After the completion of the course students will be able to:

- 1. Understanding of the fundamental concepts of computer networking.
- 2. Apply the basic taxonomy and terminology of the computer networking area.
- 3. Identify the different types of network devices and their functions within a network.

4. Understand internetworking principles, routing principles and algorithms such as IP, IPv6, distance vector, and link state.

5. Conclude advanced networking concepts and advanced courses in computer networking.6. Gain expertise in some specific areas of networking such as the design and maintenance of individual networks.

*LOCQ: Lower Order Cognitive Question; IOCQ: Intermediate Order Cognitive Question; HOCQ: Higher Order Cognitive Question

Department & Section	Submission Link
ECE	https://classroom.google.com/c/NDA2MzExMjUyMjMx/a/NDYzODU1Nzg2OTgw/details
Backlog	https://classroom.google.com/c/NDA2MzExMjUyMjMx