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B.E DEGREE EXAMINATIONS: MAY 2017

(Regulation 2014)

Sixth Semester

ELECTRONICS AND COMMUNICATION ENGINEERING

U14ECT602: Computer Networks

COURSE OUTCOMES

CO1: Explain the networks, topologies and layers of OSI model, compare with TCP/IP model.
CO2: Classify error control and flow control techniques and types of LAN technologies.
CO3: Analyze different routing algorithms and methods to improve QOS.
CO4: Summarize the transport layer protocols and congestion controls methods.
CO5: Describe various application layer services and cryptographic techniques.

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The Network topology that supports bi-directional links between each possible node is   CO1   [K$_2$]

    a)   Ring   b)   Star

    c)   Tree   d)   Mesh

2. Which of the following is an application layer service?   CO1   [K$_2$]

    i. File transfer and access   ii.Encoding   iii.Routing   iv.Mail service

    a)   i,ii   b)   iii,iv

    c)   i,iv   d)   ii,iii

3. Which of the following is NOT true with respect to a transparent bridge and a router?   CO2   [K$_2$]

    a)   Both bridge and router selectively   b)   A bridge uses IP addresses while a
         forward data packets   router uses MAC addresses
    c)   A bridge builds up its routing table by   d)   A router can connect between a LAN
         inspect-ing incoming packets   and a WAN

4. Match the following IEEE std in list I with list II   CO2   [K$_1$]

List I	List II
A.IEEE 802.3	i.Token Ring
B.IEEE 802.4	ii.Wireless LAN
C.IEEE802.5	iii.Standard Ethernet
D.IEEE802.11	iv.Token Bus

	A	B	C	D
a)	i	ii	iii	iv
b)	iii	iv	i	ii
c)	ii	iv	iii	i
d)	iii	i	ii	iv

5. Consider the following statement about IPv6:   CO3   [K₂]

1. The IPv6 improves on the addressing capacities of IPv4 by using 128 bits instead of 32 bits, thereby practically making available an almost infinite pool of IP addresses.

2. IPv6 addresses are denoted by four groups of hexadecimal quartets separated by colons in between them.

3. The IPv6 networks are denoted by Classless Inter Domain Routing (CIDR) notation.
Which of the above statements is/are correct?

a) 1, 2 and 3   1 and 3

c) 1 and 2   2 and 3

6. Assertion : After a topology change, a link state protocol will converge faster than a distance   CO3   [K₃]

vector protocol.

Reason: A distance vector protocol (with split horizon) avoids persistent routing loops, but

not a link state protocol.

a) Both A and R are Individually true and   b) Both A and R are Individually true but

R is the correct explanation of A   R is not the correct explanation of A

c) A is true but R is false   d) A is false but R is true

7. Give the correct sequence of the steps to be carried out in connection oriented service.   CO4   [K₂]
1. Data transfer.
2. Connection establishment.
3. Disconnection request.
4.Connection release.

a) 2-4-3-1   b) 4-3-1-2

c) 2-1-3-4   d) 4-3-2-1

8. Match the list I with list II   CO4   [K₁]

List I	List II
A. Open-loop congestion control	i. The size of the congestion window increases exponentially until it reaches a threshold.
B. Congestion avoidance algorithm	ii. Removes congestion.
C. Closed-loop congestion control	iii The size of the congestion window increases additively until congestion is detected.
D. Slow-start algorithm	iv. Prevents congestion

	A	B	C	D
a)	iv	iii	ii	i
b)	i	ii	iii	iv
c)	ii	iv	iii	i
d)	iii	i	ii	iv

9. Identify the correct order in which the following actions take place in an interaction between a web browser and a web server.   CO5 [K₃]

1. The web browser requests a webpage using HTTP.
2. The web browser establishes a TCP connection with the web server.
3. The web server sends the requested webpage using HTTP.
4. The web browser resolves the domain name using DNS.

   a) 4,2,1,3   b) 1,2,3,4

   c) 4,1,2,3   d) 2,4,1,3

10. Assertion :In Public Key encryption ,Public key is known to everyone but the private key is known only to the receiver   CO5 [K₂]

   Reason: In secret key encryption ,the sender and the receiver share a secret key

   a) Both A and R are Individually true and   b) Both A and R are Individually true but
      R is the correct explanation of A   R is not the correct explanation of A
   c) A is true but R is false   d) A is false but R is true

PART B (10 x 2 = 20 Marks)
(Answer not more than 40 words)

11. Assume six devices are arranged in a mesh topology. How many cables are needed? How many ports are needed for each device?   CO1 [K₂]

12. Show how 01011110 bit pattern is encoded using NRZ -I, Manchester,Differential Manchester encoding techniques and AMI encoding schemes   CO1 [K₂]

13. What are the types of transitions defined by IEEE 802.11 standard?   CO2 [K₁]

14. Station A needs to send a message consisting of 9 packets to Station B using a sliding window (window size 3) and go-back-n error control strategy. All packets are ready and immediately available for transmission. If every 5th packet that A transmits gets lost (but no acks from B ever get lost), then what is the number of packets that A will transmit for sending the message to B?   CO2 [K₃]

15. Differentiate between virtual circuit and datagram switching methods.   CO3 [K₂]

16. What is the difference between a direct and an indirect delivery?   CO3 [K₂]

17. Define IANA port ranges   CO4 [K₁]

18. Compare guaranteed service class and controlled service class in Integrated service.   CO4 [K₂]

19. What is anonymous FTP?   CO5 [K₁]

20. Contrast straight, compressed and expanded permutation of cryptography.   CO5 [K₂]

Answer any FIVE Questions:-
PART C (5 x 14 = 70 Marks)
(Answer not more than 300 words)

Q.No. 21 is Compulsory

21	i)What are the advantages of organizing network architectures in layers? Explain functions of different layers in ISO/OSI model associated for a data transfer between any two nodes?	(10)	CO1	[K$_2$]
	ii) Why TCP/IP reference model is more popular than OSI model?	(4)	CO1	[K$_2$]
22.	i) The data word to be transmitted is 1010011110 and the divisor used for error correction is 10111.Generate the codeword at the sender site. Suppose that the code word has a transmission error in the third bit. What does the receiver obtain when it does error checking?	(7)	CO2	[K$_3$]
	ii) Explain the concept of sliding window technique used in flow control techniques and discuss about one bit sliding window protocol	(7)	CO2	[K$_3$]
23.	i) An organization is granted the block 211.17.180.0/24. The administrator wants to create 32 subnets.	(6)	CO3	[K$_3$]
	a. Find the subnet mask.			
	b. Find the number of addresses in each subnet.			
	c. Find the first and last addresses in subnet 1.			
	ii) Describe the various transmission media used for data communication.	(8)	CO1	[K$_2$]
24.	i) Differentiate between reliable and unreliable protocols used for process to process delivery. Enlighten in detail about reliable and connection oriented protocol used in transport layer.	(10)	CO4	[K$_2$]
	ii) What is meant by network congestion? Explain any one congestion control mechanisms.	(4)	CO4	[K$_2$]
25.	Formulate the distance vector routing algorithm with a sample topology. Discuss the problems faced in the execution of the algorithm and state the possible solutions		CO3	[K$_2$]
26.	i)Distinguish between a fully qualified Domain Name Service and partially qualified Domain Name Service. Also discuss the key features of DNS.	(10)	CO5	[K$_3$]
	ii) Compare the functionality of SMTP and HTTP	(4)	CO5	[K$_3$]
27.	Classify the types of encryption algorithms. Discuss in detail about symmetric key cryptography.		CO5	[K$_3$]

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