Total No. of Questions: 6 *Total No. of Printed Pages:2*

Enrollment No.....

Faculty of Engineering
End Sem Examination May-2024
EC3EL02 Data Communication & Computer Networks

Programme: B.Tech. Branch/Specialisation: EC

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Q.1 i. Which type of topology is best suited for large businesses which must carefully control and coordinate the operation of distributed branch outlets? **1**

(a) Ring (b) Local area (c) Hierarchical (d) Star

ii. A local telephone network is an example of a _____ network. **1**

(a) Packet switched (b) Circuit switched
(c) Bit switched (d) Line switched

iii. "Parity bits" are used for which of the following purposes? **1**

(a) Encryption of data (b) To transmit faster
(c) To detect errors (d) To identify the user

iv. Which of the following tasks is not done by data link layer? **1**

(a) Framing (b) Error control
(c) Flow control (d) Channel coding

v. What is the size of MAC address in medium access control sub layer? **1**

(a) 48bytes (b) 48bits (c) 32bits (d) 32 bytes

vi. Networking Hardware Address is referred with _____. **1**

(a) IP address
(b) MAC address
(c) NIC
(d) Organizationally Unique Identifier

vii. The network layer protocol for internet is _____. **1**

(a) Ethernet
(b) Internet protocol
(c) Hypertext transfer protocol
(d) File transfer protocol

viii. The network layer is concerned with _____ of data. **1**

(a) Bits (b) Frames (c) Packets (d) bytes

ix. Which is not an application layer protocol? **1**

(a) HTTP (b) SMTP (c) FTP (d) TCP

x. The packet of information at the application layer is called _____. **1**

(a) Packet (b) Message (c) Segment (d) Frame

Q.2 i. Define circuit switching, packet switching and message switching. **3**

ii. How are the OSI and TCP/IP models different? **7**

OR iii. Explain the function of physical link layer in detail. How digital data is transmitted? What is transmission impairments? **7**

Q.3 i. Explain sliding window protocol. **4**

ii. A bit stream 1101011011 is transmitted using the standard CRC method. The generator polynomial is x^4+x+1. What is the actual bit string transmitted? Find CRC for the same. **6**

OR iii. Compare the various ARQ techniques for error and flow control. **6**

Q.4 i. What is pure ALOHA and slotted ALOHA? **4**

ii. Explain the architecture of IEEE802.11 LAN standard with its frame format. **6**

OR iii. Explain CSMA/CD and CSMA/CA. **6**

Q.5 i. Explain services provided by the network layer. **4**

ii. What is shortest path routing? Explain any one commonly used shortest path algorithm. **6**

OR iii. Explain IPv6 header format. Explain IPv6 protocol. Why is it important? What are the advantages of IPv6 over IPv4? How many IP addresses does ipv6 support? **6**

Q.6 Attempt any two:

i. Explain leaky bucket algorithm. **5**

ii. How to improve QoS? What is choke packets? **5**

iii. Write in detail about HTTP and SMTP. **5**

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Scheme of Marking
Data Communication & Computer Networks (T) - EC3EL02 (T)

Q.1	i)	**C Hierarchical**	**1**
	ii)	b) Circuit switched	**1**
	iii)	c) To detect errors	**1**
	iv)	d) channel coding	**1**
	v)	b) 48 bits	**1**
	vi)	b) MAC address	**1**
	vii)	**B**	**1**
	viii)	**C**	**1**
	ix)	d) TCP	**1**
	x)	b) Message	**1**
Q.2	i.	One mark each	**3**
	ii.	One mark each	**7**
OR	iii.	physical link layer 4 marks, data transmit 2 marks, transmission impairments 1 mark	**7**
Q.3	i.	sliding window protocol	**4**
	ii.	iii. The generator polynomial $G(x) = x^4 + x + 1$ is encoded as 10011. 2 Marks iv. Clearly, the generator polynomial consists of 5 bits. v. So, a string of 4 zeroes is appended to the bit stream to be transmitted. 3 Marks vi. The resulting bit stream is 1101011011**0000** CRC = 100. 1 Mark	**6**
OR	vii.	ARQ Techniques (2 Mark each)	**6**
Q.4	i.	Pure Aloha 2 Marks Slotted 2 Marks	**4**
	ii.	Architecture 4 Marks Frame 2 Marks	**6**
OR	iii.	a) CSMA/CA 3 Marks b) CP 3 Marks	**6**
Q.5	i.	Two marks each	**4**
	ii.	3 marks each	**6**
OR	iii.	Header format 2 marks IPV6 4 Marks	**6**
Q.6			
	i.	algorithm.	**5**
	ii.	QoS 4 marks, choke packet 1 mark	**5**
	iii.	HTTP 2.5 MARKS AND SMTP 2.5 MARKS	**5**

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