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

Enrollment No.....

Faculty of Engineering
End Sem Examination May-2023
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. Characteristics of interface and media are defined at which layer of ISO-OSI reference model? **1**
(a) Application (b) Session (c) Presentation (d) Physical

ii. TDM is implemented for three users. The data rate of each input connection is 1 kbps with 1 bit at a time is multiplexed, what is the output frame duration? **1**
(a) 3ms (b) 1ms (c) 3kbps (d) 1kbps

iii. Following is NOT the error detection method: **1**
(a) Checksum (b) CRC (c) Stop & Wait (d) LRC

iv. CRC-32 finds application in- **1**
(a) ATM (b) HDLC (c) LAN (d) SDLC

v. IEEE started a project called as _____ to set standards to enable intercommunication among equipment from various vendors. **1**
(a) Project 802 (b) Project 803
(c) Project 804 (d) Project 805

vi. LLC sub-layer of data link layer is responsible for- **1**
(a) Defining MAC address (b) Framing
(c) Error and flow control (d) Media access control

vii. In following routing protocol, entire routing table is sent as an update- **1**
(a) Distance vector (b) Link state
(c) Flooding (d) None of these

viii. Following is the incorrect IPv6 address: **1**
(a) FDEC:0:0:0:0:BBFF:0:FFFF (b) FDEC::BBFF:0:FFFF
(c) FDEC:BBFF:FFFF (d) FDEC::BBFF:0:FFFF/60

P.T.O.

ix. The combination of IP address and Port address is called as- **1**
(a) Socket address (b) Network address
(c) Broadcast address (d) Physical address

x. _____ is called as connection-less unreliable transport protocol. **1**
(a) TCP (b) UDP (c) SMTP (d) HTTP

Q.2 i. Where does the circuit switching and packet switching techniques are used in real world communication and networking? **2**

ii. Why does increasing the transmission levels of a signal increases the probability of an error occurring? Give the formula for calculating channel capacity in noisy and noiseless channels. **3**

iii. Draw and explain TCP/IP protocol suite. **5**

OR iv. Explain the working of space division switches. **5**

Q.3 i. Obtain checksum for following stream of data. **3**
1100 0101 1010 1111 0110 0111

ii. What is the limitation of checksum method? Obtain Frame check sequence using CRC method when message polynomial is- $X^8+X^7+X^5+X^4$ and divisor polynomial is X^4+X^3+1. **7**

OR iii. Explain various ARQ techniques used for error and flow control. **7**

Q.4 i. Give the implementation details of popular wired LAN standard. **4**

ii. Draw and explain flow diagram of three persistence methods in CSMA. **6**

OR iii. Write short note on IEEE 802.11 WLAN standard. **6**

Q.5 i. Given IP address 140.10.0.2, find the network address, subnet address, host address range and broadcast address. **4**

ii. How link state packets are built in Link State routing protocol? **6**

OR iii. Draw and explain the frame format of IPv4. Mention four reasons for shifting to IPv6 from IPv4. **6**

Q.6 Attempt any two:

i. Explain transport layer services. **5**

ii. Elaborate techniques to improve QoS. **5**

iii. Write short note on Domain Name System. **5**

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Marking Scheme

EC3EL02 Data Communication and Computer Networks

Q.1	i)	d) Physical		**1**
	ii)	b) 1ms		**1**
	iii)	c) Stop & Wait		**1**
	iv)	c) LAN		**1**
	v)	a) Project 802		**1**
	vi)	c) Error and Flow Control		**1**
	vii)	a. Distance Vector		**1**
	viii)	c. FDEC:BBFF:FFFF		**1**
	ix)	a. Socket address		**1**
	x)	b. UDP		**1**
Q.2	i.	The circuit switching: PSTN and	1Mark	**2**
		Packet switching techniques: Internet	1Mark	
	ii.	Why does increasing the transmission levels of a signal increases the probability of an error occurring? 1 Marks Formula for calculating channel capacity in noisy: Nyquist 1 Mark and noiseless channels: Shannon	1 Mark	**3**
	iii.	Draw and explain TCP/IP protocol suite.		**5**
		Draw	2 Marks	
		Explain	3 Marks	
OR	iv.	Explain the working of space division switches.		**5**
		Cross bar switching	2.5 Marks	
		Multi-Stage switching	2.5 Marks	
Q.3	i.	Obtain checksum for following stream of data. 1100 0101 1010 1111 0110 0111		**3**
		Checksum: 0101	3 Marks	
	ii.	What is the limitation of checksum method?		**7**
		If one or more bits of a segment are damaged and the corresponding bit or bits of opposite value in a second segment are also damaged, the sums of those columns will not change and the receiver will not detect a problem.	2 Marks	
		Obtain Frame check sequence using CRC method when message polynomial is $X^8+X^7+X^5+X^4$ and divisor polynomial is X^4+X^3+1.		
		Polynomial to bits conversion	1 Marks	
		FCS calculation	4 Marks	

OR	iii.	Explain various ARQ techniques used for error and flow control.		**7**
		Stop & Wait ARQ	2Marks	
		Go-Back N ARQ	2.5 Marks	
		Selective Reject ARQ	2.5 Marks	
Q.4	i.	Give the implementation details of popular wired LAN standard.		**4**
		Four Generation	1 Marks each	
	ii.	Draw and explain flow diagram of three persistence methods in CSMA.	2 Marks each	**6**
OR	iii.	IEEE WLAN standard	6 Marks	**6**
Q.5	i.	Given IP address 140.10.0.2, find the beginning address (network address), host address range and broadcast address.		**4**
		140.10.0.0 n/w address	1 Marks	
		Subnet address	1 Marks	
		Host address range	1 Marks	
		Broadcast address	1 Marks	
	ii.	How link state packets are built in Link State routing protocol?		**6**
		LSP example	2 Marks	
		LSP explanation	4 Marks	
OR	iii.	Draw and explain the frame format of IPv4. Mention four reasons for shifting to IPv6 from IPv4.		**6**
		IPv4 frame format	4 Marks	
		4 Reasons	2 Marks	
Q.6		Attempt any two:		
	i.	Explain transport layer services.	2.5 Marks each	**5**
	ii.	Elaborate techniques to improve QoS.	1.25 for each	**5**
	iii.	Write short note on Domain Name System.		**5**

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