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

Enrollment No.....

Faculty of Engineering / Science

End Sem (Odd) Examination Dec-2022

CS3CO28 / BC3CO39 Data Communication

Programme: B.Tech. / B. Sc. Branch/Specialisation: CSE / Computer Science

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.

Q.1 i. Which are guided media? **1**
(a) Radio broadcasting (b) Cellular telephone system
(c) Satellite communications (d) Local telephone system

ii. Bandwidth of the signal that ranges from 40Hz to 4KHz- **1**
(a) 3.96KHz (b) 396KHz (c) 39.6KHz (d) 3.96Hz

iii. Carrier signal in modulation technique is _____ signal. **1**
(a) High frequency (b) Low frequency
(c) High amplitude (d) Low amplitude

iv. Which of the following is not a digital-to-analog conversion? **1**
(a) ASK (b) PSK (c) FSK (d) AM

v. A local telephone network is an example of a _____ network. **1**
(a) Packet switched (b) Circuit switched
(c) Bit switched (d) Line switched

vi. Which network topology requires a central controller or hub? **1**
(a) Star (b) Mesh (c) Ring (d) Bus

vii. The network layer is concerned with _____ of data. **1**
(a) Bits (b) Frames (c) Packets (d) Bytes

viii. A 4 byte IP address consists of _____. **1**
(a) Only network address
(b) Only host address
(c) Network address & host address
(d) None of these

ix. In cyclic redundancy checking, what is CRC? **1**
(a) Quotient (b) Divisor (c) Dividend (d) Remainder

P.T.O.

x. Calculate VRC for data 11010101 (consider odd parity generator). **1**
(a) 0 (b) 1 (c) 2 (d) None of these

Q.2 i. Write the Shannon's channel capacity and Nyquist's channel capacity formula. **2**

ii. Write the definition of bandwidth, propagation time, and throughput. **3**

iii. Discuss different transmission impairment in data communication. **5**

OR iv. Explain different guided transmission media in detail. **5**

Q.3 i. Discuss the concept of time division multiplexing with neat diagram. **4**

ii. Discuss LZ compression technique in detail with example. **6**

OR iii. Encode the bit pattern 111100011001 using Manchester, Differential Manchester, NRZ-L and NRZ-I. **6**

Q.4 i. What do you understand by connection oriented and connection less services? **4**

ii. Discuss various topologies with their advantages and disadvantages. **6**

OR iii. Distinguish between virtual circuit packet switching and datagram packet switching technique. **6**

Q.5 i. Explain the working of network layer in OSI model. **4**

ii. Explain physical addressing, logical addressing and port addressing. **6**

OR iii. Explain different Internetworking devices- switch, router, gateway, bridge. **6**

Q.6 Attempt any two:

i. Explain error correction technique with suitable example. **5**

ii. Explain parity checking mechanism with suitable example. **5**

iii. Generate redundant bit using cyclic redundancy check algorithm when data word is 1001 and divisor is 1011. **5**

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Marking Scheme
CS3CO28 / BC3CO39 Data Communication

Q.1	i.	Which are guided media? (d) Local telephone system		**1**
	ii.	Bandwidth of the signal that ranges from 40Hz to 4KHz- (a) 3.96KHz		**1**
	iii.	Carrier signal in modulation technique is _____ signal. (a) High frequency		**1**
	iv.	Which of the following is not a digital-to-analog conversion? (d) AM		**1**
	v.	A local telephone network is an example of a _____ network. (b) Circuit switched		**1**
	vi.	Which network topology requires a central controller or hub? (a) Star		**1**
	vii.	The network layer is concerned with _____ of data. (c) Packets		**1**
	viii.	A 4 byte IP address consists of _____. (c) Network address & host address		**1**
	ix.	In cyclic redundancy checking, what is CRC? (d) Remainder		**1**
	x.	Calculate VRC for data 11010101 (consider odd parity generator). (a) 0		**1**
Q.2	i.	Shannon's channel capacity formula Nyquist's channel capacity formula.	1 mark 1 mark	**2**
	ii.	Definition of bandwidth, propagation time, and throughput. 1 mark for each definition	 (1 mark * 3)	**3**
	iii.	Transmission impairment Three impairment 1.5 marks for each (1.5 marks *3)	0.5 mark 4.5 marks	**5**
OR	iv.	Guided transmission media Three guided media 1.5 marks for each (1.5 marks * 3)	0.5 mark 4.5 marks	**5**
Q.3	i.	Concept of time division multiplexing Diagram	2 marks 2 marks	**4**
	ii.	LZ compression technique Example	3 marks 3 marks	**6**
OR	iii.	Encode the bit pattern 111100011001 using Manchester, Differential Manchester, NRZ-L and NRZ-I. 1.5 marks for each	 (1.5 marks * 4)	**6**
Q.4	i.	Connection oriented services Connection less services	2 marks 2 marks	**4**
	ii.	At least four topologies with their advantages and disadvantages 1.5 marks for each	 (1.5 marks * 4)	**6**
OR	iii.	Four distinguish points virtual circuit packet switching and datagram packet switching technique 1.5 marks for each	 (1.5 marks * 4)	**6**
Q.5	i.	Working of network layer in OSI model Diagram Explanation	 2 marks 2 marks	**4**
	ii.	Physical addressing, logical addressing and port addressing. 2 marks for each	 (2 marks * 3)	**6**
OR	iii.	Internetworking devices- switch, router, gateway, bridge. 1.5 marks for each	 (1.5 marks * 4)	**6**
Q.6		Attempt any two:		
	i.	Error correction technique Example.	3 marks 2 marks	**5**
	ii.	Parity checking mechanism Example	3 marks 2 marks	**5**
	iii.	Generate redundant bit using cyclic redundancy check algorithm when data word is 1001 and divisor is 1011. Complete solution		**5**

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