Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem (Even) Examination May-2018

IT3CO18 Data Communication

Programme: B.Tech. Branch/Specialisation: IT

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. Frequency of failure and network recovery time after failure is measure of the _____ of a network. **1**

(a) Performance (b) Reliability (c) Security (d) Feasibility

ii. In an optical fiber the inner core is _____ cladding. **1**

(a) More dense than (b) Less dense than

(c) Same density as (d) Another name for.

iii. Synchronous serial transmission does not have. **1**

(a) Start bit (b) Stop bit

(c) Gaps between the bytes (d) All of these

iv. According to FCC regulation, the carrier frequency of adjacent AM radio stations are_____ apart **1**

(a) 5KHz (b) 10KHz (c) 200KHz (d) 550KHz

v. ASK, FSK, PSK are examples of _____ modulation. **1**

(a) Digital to digital (b) Digital to analog

(c) Analog to digital (d) Analog to analog.

vi. Frequency division Multiplexing involves _____ **1**

(a) One path on one medium (b) One path on multiple medium

(c) Multiple path on one medium (d) Multiple path on multiple medium

vii. In Cyclic Redundancy check what is CRC. **1**

(a) Divisor (b) Quotient (c) Divident (d) Remainder

viii. Hamming code is a method of **1**

(a) Error detection (b) Error correction

(c) Error encapsulation (d) Both (a) and (b)

P.T.O.

ix. Permanent virtual circuit involves: **1**
(a) Data establishment (b) Data transfer .
(c) Connection Release (d) All of these

x. GPS Stands for: **1**
(a) Global Positioning Source (b) Global protocol system
(c) Global positioning system (d) Global Prapogation Source

Q.2 i. With a neat communication block diagram discuss its fundamental characteristics. **2**

ii. The SNR is given in decibel. Assume the SNR (dB) = 36 and the channel B.W. is 2MHz. Find the theoretical channel capacity. **3**

iii. Discuss the important parameters that affect the network performance. A network with B.W. of 10Mbps can pass only an average 12,000 frames per minute with each frame carrying an average of 10,000 bit. What is the throughput of the network? **5**

OR iv. Differentiate between guided and unguided transmission medium. Draw labled diagram for types of guided transmission media. **5**

Q.3 i. Explain types of serial communication. **2**

ii. Define modulation. Mention its types. **3**

iii. Encode the bit pattern "11001100101" using Unipolar, polar RZ, NRZ-I, Manchester and AMI encoding schemes. **5**

OR iv. Using block diagram explain Pulse code Modulation **5**

Q.4 i. Define the concept of Spread Spectrum. **2**

ii. Draws ASK, FSK and PSK waveform for the data bits "1011001". Assuming high frequency sinusoidal carrier wave. **3**

iii. Explain frequency hopping Spread spectrum with suitable example. Briefly discuss the types of FHSS. **5**

OR iv. Four channels each with a capacity of 100kbps are time division multiplexed. The unit is 1 bit. Draw the output frame and Calculate **5**
(a) Number of bits in a frame (b) Frame duration
(c) Output bit rate (d) Frame rate.

Q.5 i. What is parity? Calculate even and odd parity for the message bits – 1011011. **2**

ii. Calculate the CRC code for the data 110101010. The divisor used is 10101. **3**

iii. Design the checksum code for the bit stream **5**
"10100101001001100101010110101010110011000010010 0".
Assuming the bits is grouped into bytes.

OR iv. Seven bit message is transmitted using Hamming Code. How many check bits are needed to ensure that receiver can detect and correct single bit error. Show the bit pattern transmitted for the message "1001101" **5**

Q.6 i. Explain crossbar switches and cross points. **2**

ii. Explain types of architecture used in Wi-Fi. **3**

iii. Explain virtual circuit packet switched approach. **5**

OR iv. Write short note on any two: **5**
(a) Wi- Max (b) GSM (c) GPRS

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Marking Scheme
IT3CO18 Data Communication

Q.1	i.	Frequency of failure and network recovery time after failure is measure of the _____ of a network. (b) Reliability		**1**
	ii.	In an optical fiber the inner core is _____ cladding. (a) More dense than		**1**
	iii.	Synchronous serial transmission does not have. (d) All of these		**1**
	iv.	According to FCC regulation, the carrier frequency of adjacent AM radio stations are_____ apart (b) 10KHz		**1**
	v.	ASK, FSK, PSK are examples of _____ modulation. (b) Digital to analog		**1**
	vi.	Frequency division Multiplexing involves _____ (b) One path on multiple medium		**1**
	vii.	In Cyclic Redundancy check what is CRC. (d) Remainder		**1**
	viii.	Hamming code is a method of (d) Both (a) and (b)		**1**
	ix.	Permanent virtual circuit involves: (d) All of these		**1**
	x.	GPS Stands for: (c) Global positioning system		**1**
Q.2	i.	Block diagram	1 mark	**2**
		4 characteristics 0.25 each (0.25 mark * 4)	1 mark	
	ii.	Finding SNR	1 mark	**3**
		Formula for capacity	1 mark	
		Final answer	1 mark	
	iii.	Define 3 parameters 1 mark each (1 mark * 3)	3 marks	**5**
		Calculating throughput	2 marks	
OR	iv.	Definition guided and unguided medium	2 marks	**5**
		Diagram of UTP, Coaxial, OFC 1 mark each (1 mark *3)	3 marks	
Q.3	i.	Synchronous Transmission	1 mark	**2**
		Asynchronous Transmission.	1 mark	
	ii.	Modulation definition	1.5 marks	**3**
		Types	1.5 marks	
	iii.	Each encoding	(1 mark * 5)	**5**
OR	iv.	Block diagram of PCM	1 mark	**5**
		Explanations of sampling	1 mark	
		Explanations of quantization	1 mark	
		Explanations of encoding	1 mark	
		Diagram for quantizes	1 mark	
Q.4	i.	Definition spread spectrum	2 marks	**2**
	ii.	Waveform of ASK,FSK,PSK 1 mark each	(1 mark * 3)	**3**
	iii.	Definition FHSS	1 mark	**5**
		Example	1 mark	
		Diagram	1 mark	
		2 types 1 mark each (1 mark *2)	2 marks	
OR	iv.	Draw the output frame	1 mark	**5**
		Calculate Number of bits in a frame	1 mark	
		Frame duration	1 mark	
		Output bit rate	1 mark	
		Frame rate	1 mark	
Q.5	i.	Define parity	1 mark	**2**
		Even parity and odd parity	1 mark	
	ii.	Calculate the CRC		**3**
	iii.	Grouping in 8 bits	1 mark	**5**
		Getting answer	4 marks	
OR	iv.	Formula for finding redundancy	1 mark	**5**
		Finding correct code	4 marks	
Q.6	i.	Crossbar	1 mark	**2**
		Crosspoint	1 mark	
	ii.	BSS with diagram	1.5 marks	**3**
		ESS with diagram	1.5 marks	
	iii.	Virtual circuit packet switched approach Diagram	2 marks	**5**
		3 phases 1 mark each (1 mark * 3)	3 marks	
OR	iv.	Write short note on any two: 2.5 marks each (a) Wi- Max (b) GSM (c) GPRS	(2.5 marks * 2)	**5**

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