

Enrollment No.....



Faculty of Engineering
End Sem (Even) Examination May-2022
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. A digital signal has a bit interval of 40 ms, what is the bit rate? **1**
(a) 25 Kbps (b) 25 Mbps (c) 25 bps (d) 25 Gbps
- ii. A sine wave has offset 1/3 of a cycle with respect to time zero, calculate phase **1**
(a) 60 degree (b) 180 degree
(c) 120 degree (d) 90degree
- iii. The spectrum of the sampled signal may be obtained without overlapping only if **1**
(a) $f_s = 2f_m$ (b) $f_s \geq 2f_m$ (c) $f_s > 2f_m$ (d) $f_s < 2f_m$
- iv. Carrier signal in modulation technique is **1**
(a) Low amplitude signal (b) Low frequency signal
(c) High amplitude signal (d) High frequency signal
- v. Which is called as ON – OFF keying **1**
(a) ASK (b) Uni - polar PAM
(c) Both (a) and (b) (d) FSK
- vi. DSSS techniques expands the BW of a signal by replacing each data bit with **1**
(a) N+1bits (b) N-1 bits (c) N bits (d) All of these
- vii. VRC for 1101101111100 by even parity **1**
(a) 1 (b) 0
(c) Both (a) and (b) (d) None of these
- viii. Redundancy added in the frame as **1**
(a) Header (b) Trailer
(c) Both (a) and (b) (d) None of these

- ix. WiMAX provides **1**
(a) Simplex communication
(b) Half duplex communication
(c) Full duplex communication
(d) None of these
- x. IEEE 802.11 standards specifies **1**
(a) Wireless communication standards
(b) Wired communication standards
(c) Both (a) and (b)
(d) None of these

- Q.2 i. Define transmission mode and its types? **4**
ii. Explain various transmission media in detail? **6**
- OR iii. Discuss different types of transmission impairments? **6**
- Q.3 i. Write short note on PCM? **4**
ii. Differentiate between serial and parallel transmission? **6**
- OR iii. Encode data 11011001 using various line code techniques? **6**
- Q.4 Attempt any two: **5**
i. Describe CDMA with suitable example? **5**
ii. Compare synchronous and asynchronous TDM in tabular format? **5**
iii. What is the need of spread spectrum modulation? Discuss in detail about FHSS? **5**
- Q.5 i. Generate LRC and Checksum for data 1111110010010010011001 **4**
ii. Check the presence of error in the codeword 1100100101001, the divisor is $x^4 + x + 1$. **6**
- OR iii. Generate hamming code for data 1001101 and check the correctness of your code? **6**
- Q.6 Attempt any two: **5**
i. Compare various switching techniques? **5**
ii. Describe the services offered by GSM. or Wi-Fi? **5**
iii. Discuss GPRS architecture reference model with suitable diagram? **5**

P.T.O.

Marking Scheme
IT3CO18 Data Communication

Q.1	i.	A digital signal has a bit interval of 40 ms, what is the bit rate? (a) 25 Kbps	1	1
	ii.	A sine wave has offset 1/3 of a cycle with respect to time zero, calculate phase (c) 120 degree	1	1
	iii.	The spectrum of the sampled signal may be obtained without overlapping only if (b) $f_s \geq 2f_m$	1	1
	iv.	Carrier signal in modulation technique is (d) High frequency signal	1	1
	v.	Which is called as ON – OFF keying (c) Both (a) and (b)	1	1
	vi.	DSSS techniques expands the BW of a signal by replacing each data bit with (c) N bits	1	1
	vii.	VRC for 1101101111100 by even parity (a) 1	1	1
	viii.	Redundancy added in the frame as (b) Trailer	1	1
	ix.	WiMAX provides (c) Full duplex communication	1	1
	x.	IEEE 802.11 standards specifies (a) Wireless communication standards	1	1
Q.2	i.	Definition of transmission mode Its types (Diagram + Example)	1 mark 3 marks	4
	ii.	Any three transmissions media 2 marks for each	(2 marks * 3)	6
OR	iii.	Any three types of transmission impairments 2 marks for each	(2 marks * 3)	6
Q.3	i.	Explanation of PCM Diagram of PCM	2 marks 2 marks	4
	ii.	Difference between serial and parallel transmission Any six points 1 mark for each	(1 mark * 6)	6
OR	iii.	Encode data 11011001 using various line code techniques Using six line coding techniques 1 mark for each	(1 mark * 6)	6

Q.4		Attempt any two:		
	i.	CDMA Example	3 marks 2 marks	5
	ii.	Compare synchronous and asynchronous TDM in tabular format Any five points 1 mark for each	(1 mark * 5)	5
	iii.	Need of spread spectrum modulation FHSS	1 mark 4 marks	5
Q.5	i.	Generate LRC for data 1111110010010010011001 Checksum for data 1111110010010010011001	2 marks 2 marks	4
	ii.	Check the presence of error in the codeword 1100100101001, Divisor representation Answer	1 mark 5 marks	6
OR	iii.	Generate hamming code for data 1001101 Check the correctness of your code	4 marks 2 marks	6
Q.6		Attempt any two:		
	i.	Compare various switching techniques Any five points 1 mark for each	(1 mark * 5)	5
	ii.	Services offered by GSM. or Wi-Fi Any five points 1 mark for each	(1 mark * 5)	5
	iii.	GPRS architecture reference model Diagram	2.5 marks 2.5 marks	5
