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

Enrollment No.....

Faculty of Engineering

End Sem (Even) Examination May-2019

EI3CO04 Communication System

Programme: B.Tech. Branch/Specialisation: EI

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. In a communications system, noise is most likely to affect the signal **1**
(a) At the transmitter (b) At the channel
(c) At the information source (d) At the destination

ii. Decrease in strength of signal is known as **1**
(a) Tuning (b) Modulation
(c) Attenuation (d) Amplification

iii. If the carrier of a 100 percent modulated AM wave is suppressed, the percentage power saving will be **1**
(a) 50 (b) 150 (c) 100 (d) 66.6

iv. Main disadvantage of FM over AM **1**
(a) High output power is needed
(b) High modulating power is needed
(c) Noise is very high for high frequency
(d) Large bandwidth is required

v. Unwanted signal that distorts a transmitted signal is called **1**
(a) Analogue (b) Noise (c) Digital (d) Tuning

vi. Noise figure measures the **1**
(a) Power degradation (b) Noise degradation
(c) SNR degradation (d) None of these

vii. Analog information is converted to digital data using **1**
(a) Sampling (b) Quantization
(c) Coding (d) All of these

viii. Which of the following is analog? **1**
(a) PCM (b) PWM
(c) Delta modulation (c) Differential PCM

P.T.O.

ix. In Binary Phase Shift Keying system, the binary symbols 1 and 0 are represented by carrier with phase shift of **1**
(a) Π/2 (b) Π (c) 2Π (d) 0

x. The bandwidth of BFSK is _____ than BPSK. **1**
(a) Lower (b) Same (c) Higher (d) Not predictable

Q.2 i. What is the difference between baseband and passband signal? **2**

ii. Define modulation and demodulation process? **3**

iii. What are the characteristics of communication channel? **5**

OR iv. Explain in detail the block diagram of communication system. **5**

Q.3 i. Compare Narrowband FM and wideband FM. **2**

ii. Derive the mathematical expression of AM, draw spectrum and explain the generation technique of AM. **8**

OR iii. Explain the concept of instantaneous frequency and total angle. Derive the expression of FM. How many types of FM is available and on what basis it is categorized. **8**

Q.4 i. Define white noise with its PSD. **3**

ii. Explain in phase and quadrature phase component in noise. Write its properties. **7**

OR iii. Define noise bandwidth and derive the expression of equivalent noise bandwidth. **7**

Q.5 i. Briefly explain the time division multiplexing with suitable expression. **4**

ii. Explain the pulse code modulation in detail with appropriate diagram and waveform. **6**

OR iii. Derive the mathematical expression of flat top sampled signal and also draw its spectrum. **6**

Q.6 Attempt any two:

i. Define ASK. Derive the expression to obtain the probability of error for ASK. **5**

ii. Explain in detail the quadrature amplitude modulation. **5**

iii. Explain mathematically the generation and coherent detection of BPSK. **5**

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Marking Scheme
EI3CO04 Communication System

Q.1	i.	In a communications system, noise is most likely to affect the signal (b) At the channel		**1**
	ii.	Decrease in strength of signal is known as (c) Attenuation		**1**
	iii.	If the carrier of a 100 percent modulated AM wave is suppressed, the percentage power saving will be (d) 66.6		**1**
	iv.	Main disadvantage of FM over AM (d) Large bandwidth is required		**1**
	v.	Unwanted signal that distorts a transmitted signal is called (b) Noise		**1**
	vi.	Noise figure measures the (c) SNR degradation		**1**
	vii.	Analog information is converted to digital data using (d) All of these		**1**
	viii.	Which of the following is analog? (b) PWM		**1**
	ix.	In Binary Phase Shift Keying system, the binary symbols 1 and 0 are represented by carrier with phase shift of (b) Π		**1**
	x.	The bandwidth of BFSK is _____ than BPSK. (c) Higher		**1**
Q.2	i.	Any two differences between baseband and passband signal 1 mark for each	(1 mark * 2)	**2**
	ii.	Modulation Demodulation process	1.5 marks 1.5 marks	**3**
	iii.	Characteristics of communication channel		**5**
OR	iv.	Communication system Block diagram Description	 1 mark 4 marks	**5**
Q.3	i.	Compare Narrowband FM and wideband FM. Any four points 0.5 mark for each	 (0.5 mark * 4)	**2**
	ii.	Mathematical expression of AM Block diagram Description	2 marks 1 mark 5 marks	**8**
OR	iii.	Expression Block diagram Description	2 marks 1 mark 5 marks	**8**
Q.4	i.	Define white noise Its PSD.	2 marks 1 mark	**3**
	ii.	In phase component Quadrature phase component Its properties.	1.5 marks 1.5 marks 4 marks	**7**
OR	iii.	Noise bandwidth Expression	2 marks 5 marks	**7**
Q.5	i.	Time division multiplexing with expression Any four points 1 mark for each	 (1 mark * 4)	**4**
	ii.	Pulse code modulation Block diagram Description	 1 mark 5 marks	**6**
OR	iii.	Flat top sampled signal Expression Spectrum	 4 marks 2 marks	**6**
Q.6		Attempt any two:		
	i.	ASK Expression	1 mark 4 marks	**5**
	ii.	Quadrature amplitude modulation. Block diagram Description	 1 mark 4 marks	**5**
	iii.	Generation and coherent detection of BPSK. Expression		**5**

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