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

Enrollment No.....

Faculty of Engineering

End Sem Examination May-2023

EC3CO18 Analog Communication

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. Frequency translation is done through the process of- **1**

(a) Modulation (b) Demodulation

(c) Transmission (d) None of these

ii. In the TV broadcast there are two signals: voice and picture. For picture transmission, which of the following is used- **1**

(a) AM (b) DSB-SC (c) VSB (d) None of these

iii. The amount of frequency deviation in FM signal depends on- **1**

(a) Amplitude of the modulating signal

(b) Carrier frequency

(c) Modulating frequency

(d) Transmitter amplifier

iv. Pre-emphasis is done- **1**

(a) For boosting of modulating signal voltage

(b) For modulating signals at higher frequencies

(c) In FM before modulation

(d) All of these

v. In a super-heterodyne receiver, the frequency of local oscillator is- **1**

(a) half that of incoming signal

(b) slightly less than that of incoming signal

(c) higher than that of incoming signal

(d) equal to that of incoming signal

vi. All types of linear modulation can be detected by- **1**

(a) Product demodulator (b) Envelop detector

(c) Filtering (d) Linear detector

P.T.O.

vii. _____ is defined as the ratio of input signal to noise ratio to the output signal to noise ratio. **1**
(a) Noise figure (b) Noise temperature
(c) SNR (d) None of these

viii. The equivalent noise temperature of a network given the noise figure of the network or system is- **1**
(a) $T_0(F-1)$ (b) $T_0(F+1)$ (c) $T_0(F)$ (d) T_0/F

ix. Which of the following is false with respect to pulse modulation? **1**
(a) Less power consumption
(b) Low noise
(c) Degraded signal can be regenerated
(d) Can transmit analog as well as digital waves

x. Which of the following is false with respect to pulse position modulation? **1**
(a) Can be transmitted in broadband
(b) Modulates a high frequency carrier
(c) Pulse is narrow
(d) Pulse width changes in accordance with the amplitude of modulating signal

Q.2 i. Give the block diagram of a communication system. **2**
ii. What are the needs of modulation? **3**
iii. Derive the equation of an AM modulated carrier wave. **5**
OR iv. Derive the relation $P_t = P_c\left(1+\frac{m^2}{2}\right)$ for an AM modulated wave. **5**

Q.3 i. Compare AM and FM modulation. **2**
ii. Derive the equation of NBFM and give its block diagram representation. **8**
OR iii. Explain the indirect method of FM generation. **8**

Q.4 i. Explain the significance of pre-emphasis and de-emphasis. **3**
ii. What is Superhetrodyne? Explain the Superhetrodyne receiver. Also state why it is preferred? **7**
OR iii. Draw the block diagram of a TRF receiver and explain its working. **7**

Q.5 i. What is noise? Give the classification of noise. **4**
ii. Define correlation. Explain its properties. **6**

OR iii. Define the following terms: **6**
(a) Noise temperature
(b) Noise figure
(c) Noise bandwidth

Q.6 Write short note any two:
i. Sampling Theorem **5**
ii. Pulse Modulation **5**
iii. Generation and Detection of PAM **5**

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Marking Scheme
EC3CO18[T] Analog Communication

Q.1	i)	a) Modulation, b)Demodulation	**1**
	ii)	c) VSB	**1**
	iii)	a)Amplitude of the modulating signal	**1**
	iv)	d. All of the above	**1**
	v)	c) higher than that of incoming signal.	**1**
	vi)	a) Product demodulator	**1**
	vii)	a) Noise figure	**1**
	viii)	a) $T_0(F-1)$	**1**
	ix)	d) Can transmit analog as well as digital waves	**1**
	x)	d) Pulse width changes in accordance with the amplitude of modulating signal	**1**
Q.2	i.	Block Diagram	**2**
	ii.	Needs of modulation in one or two lines each.	**3**
	iii.	Do the step marking	**5**
OR	iv.	Do the step marking	**5**
Q.3	i.	At least two differences (one mark each) 2 differences	**2**
	ii.	Derivation of equation and Block diagram representation (4 each)	**8**
OR	iii.	Block diagram (4 Marks) explanation (4 Marks)	**8**
Q.4	i.	Pre-emphasis (1.5 Marks) De-emphasis (1.5 Marks)	**3**
	ii.	Superhetrodyne meaning (1 Marks) Block diagram (3 Marks) Explanation and reason of (3 Marks) performance	**7**
OR	iii.	Block Diagram (4 Marks) .Explanation (3 Marks)	**7**
Q.5	i.	Definition (1 Mark) classification (3 marks)	**4**

	ii.	Definition (1 Marks) properties (5 Marks)	**6**
OR	iii.	2 Marks each	**6**
Q.6			
	i.	Statement (2 Marks) Proof (3 Marks)	**5**
	ii.	Block Diagram (2 Marks) Explanation (3 Marks)	**5**
	iii.	Generation (2.5 Marks) Detection (2.5 Marks)	**5**

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