Hall Ticket Number:

1	6	0	2	2	1	7	4	8	0	5	6

Code No. : 13154 S (B) N

VASAVI COLLEGE OF ENGINEERING *(AUTONOMOUS)*, HYDERABAD

Accredited by NAAC with A++ Grade

B.E. III-Semester Supplementary Examinations, August-2023

Principles of Communication Engineering (OE-I)

Time: **3 hours** Max. Marks: **60**

*Note: Answer all questions from **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	Define Discrete time Signal?	2	1	1	1
2.	A Carrier is simultaneously modulated by two sinusoidal waves with Modulation indices of 0.2 and 0.3, Find the Modulation index of final AM signal?	2	3	1	1
3.	Find the instantaneous frequency and wavelength of the signal $5\cos\left(1800\pi t + \frac{\pi}{6}\right)$.	2	3	2	1
4.	Define Phase Modulation?	2	1	2	1
5.	What is an Aliasing Effect?	2	1	3	1
6.	Number of voltage levels in a Quantizer is 32? Find the number of bits required to represent the sample?	2	3	3	2
7.	"Parity check method can detect only even number of errors", whether the given statement is True / False? Illustrate?	2	2	4	1
8.	Write the Phase shifts followed by QPSK?	2	2	4	2
9.	If the maximum and minimum amplitudes of envelope of an AM respectively are 3 Volts and 1 Volt, Find the Modulation index of AM?	2	3	1	1,2
10.	Write any two applications of FM Signal?	2	1	2	1
	Part-B (5 × 8 = 40 Marks)				
11. a)	Derive a mathematical equation to find the percentage power saving in DSB-SC compared to Conventional AM Modulation?	4	3	1	1,2
b)	An audio frequency signal **$10\cos(1000\pi t)$** is Amplitude Modulated by a Carrier signal **$40\cos(2\pi \times 10^5)$**. Calculate Modulation index, Sideband Frequencies, Bandwidth of the AM signal and the Power required to transmit the AM signal?	4	3	1	1,2
12. a)	Define Multiplexing? Explain Frequency Division Multiplexing with neat block diagram?	4	2	2	1
b)	A single tone FM signal is given by S_FM (t)= 10cos[6000t+5sin(2200t)] . Determine Carrier Signal frequency, Frequency Deviation, Bandwidth of the FM signal and Power of the FM signal?	4	3	2	2

Contd... 2

13. a)	Determine the Nyquist rate of sampling and Nyquist interval for the signals given below? i) $2\cos(4000\pi t) + 4\sin(2000\pi t)$ ii) $4\cos(6000\pi t)\cos(3000\pi t)$	4	3	3	2
b)	What are the two errors occur in Delta modulation, explain Adaptive Delta Modulation to overcome the errors?	4	2	3	1
14. a)	The digital data transmitted through the channel is "1011010" , develop the Hamming code at the transmitter by adding redundancy bits? Also, verify the code for error detection and correction?	4	3	4	2
b)	Explain different types of Digital codes used to transmit information in Communication system?	4	1	4	1
15. a)	Derive a mathematical equation to find the percentage power saving in DSB-SC compared to Conventional AM Modulation?	4	3	1	1,2
b)	Explain the role of Pre-Emphasis and De-Emphasis in Frequency Modulation?	4	2	2	1
16. a)	Define Quantization? Explain the Quantization operation with suitable example?	4	2	3	1
b)	Define FSK? Explain the generation and Demodulation of FSK with suitable diagrams?	4	2	4	1
17.	Answer any ***two*** of the following:				
a)	Explain the operation of a basic Communication system with neat block diagram?	4	1	1	1
b)	Define Frequency Modulation? Explain Narrow Band FM by giving the time domain mathematical equation?	4	2	2	2
c)	Differentiate PAM, PPM and PWM?	4	2	3	1

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	40%
iii)	Blooms Taxonomy Level – 3 & 4	40%

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