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Code No. : 14144 D

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD*Accredited by NAAC with A++ Grade***B.E. IV-Semester Main & Backlog Examinations, July-2022****Introduction to Communication Systems (OE-II)**

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 Half duplex and full duplex communication.	2	1	1	1
2.	What is the need of modulation?	2	1	1	1
3.	Find image frequency in a super heterodyne receiver for intermediate frequency of 10.2KHz and input carrier frequency of 100MHz.	2	3	3	2
4.	Draw the block diagram of FM signal generator using phase modulator	2	1	2	1
5.	Write advantages of pulse code modulation.	2	1	4	1
6.	List applications of frequency division multiplexing	2	3	4	1
7.	A serial pulse train has a 10μs bit time. Compute data rate in bits per second.	2	3	4	1
8.	Define transmission efficiency.	2	1	5	1
9.	Write applications of Microwaves.	2	1	6	1
10.	Mention the wavelength range of visible light spectrum.	2	2	6	1
Part-B (5×8 = 40 Marks)					
11. a)	A carrier signal $c(t)=3\cos(2\pi 10^6t)$ is modulated by a message signal $m(t)= 2\cos (8\pi 10^3t)$ to generate an AM signal. Find (i)Carrier power (ii) Total AM signal power and (iii) bandwidth of AM signal for modulation index of 0.66	4	3	2	2
b)	Derive an expression of amplitude modulated (AM) signal for message signal , $m(t) = A_m \cos(\omega_m t)$ and carrier signal $c(t) = A_c \cos(\omega_c t)$.	4	3	2	2
12. a)	Describe the advantages and disadvantages of frequency modulation	4	2	2	1
b)	Explain the working of superheterodyne receiver with the help of block diagram.	4	2	3	1
13. a)	Explain the benefits of using digital techniques in communication	4	1	4	1
b)	A special PCM system uses 12-bit words and 32 channels. Data is transmitted serially with no sync pulse. The time duration for 1 bit is 488.28 ns. How many bits per frame is transmitted and at what rate?	4	3	4	2

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14. a)	Illustrate Return to zero, Non-return to zero and Manchester encoded outputs for input binary data of '11011011'.	4	3	5	2
b)	Explain the process of digital data transmission over telephone cables using MODEM	4	2	4	1
15. a)	Describe the block diagram of optical communication system with the help of neat circuit diagram	4	2	6	1
b)	Write advantages and disadvantages of microwaves	4	2	6	1
16. a)	Compare amplitude modulation and frequency modulation	4	3	1	2
b)	Explain the concept of pre-emphasis and De-emphasis techniques used in FM transmission.	4	2	2	1
17.	Answer any <i>two</i> of the following:				
a)	Explain the block diagram of time division multiplexing using pulse code modulation (PCM)	4	2	4	1
b)	Determine the hamming bits for the digital data of "10110111"	4	3	5	2
c)	Write applications of satellite communication.	4	3	6	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	37.5%
iii)	Blooms Taxonomy Level - 3 & 4	42.5%
