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Code No. : 13119F

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. (CBCS) III-Semester Main Examinations, December-2018

Introduction to Communication Systems
 (Open Elective-I)

Time: 3 hours

Max. Marks: 60

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Q.No.	Stem of the question	M	L	CO	PO
Part-A (10 × 2 = 20 Marks)					
1.	Write the frequency range of AM radio broadcast stations.	2	1	1	1
2.	An AM signal has a 32-W carrier and 4.5 W in each sideband. Compute the percentage of modulation.	2	3	2	2
3.	Draw the block diagram of FM generator using phase modulator.	2	1	3	1
4.	Compare tuned radio frequency and superheterodyne receiver.	2	3	3	1
5.	Calculate the quantizing noise on a 10-bit A/D converter with a voltage range up to 5 V	2	2	4	2
6.	List the primary benefits of using digital techniques in communication.	2	1	6	1
7.	Define transmission efficiency.	2	1	4	1
8.	What factors limit the free-space transmission of information on a light beam?	2	2	6	1
9.	List few applications of AM and FM.	2	2	2	1
10.	Draw return to zero and Manchester coded signal for data '1010'.	2	2	4	2
Part-B (5 × 8 = 40 Marks)					
11. a)	Define simplex, half duplex and full duplex and write applications of each.	4	1	1	1
b)	An AM transmitter radiates 50W, when carrier is modulated by single sinusoidal signal. Calculate peak amplitude of the carrier before and after modulation for modulation index of $\mu=0.707$.	4	3	2	2
12. a)	State how the frequency of a carrier varies in a PM system when the modulating signal amplitude and frequency change.	4	2	3	1
b)	The signal-to-noise ratio in an FM system is 4:3. The maximum allowed deviation is 4 kHz. Determine the frequency deviation, introduced by the phase shift caused by the noise when the modulating frequency is 650 Hz. What is the real signal-to-noise ratio?	4	3	3	2
13. a)	Describe the working of Time Division multiplexing using pulse Amplitude modulation with the help of block diagram.	4	1	4	1
b)	A D/A converter has a 12-bit binary input. The output analog voltage range is 0 to 5 V. How many discrete output voltage increments are there and what is the smallest voltage increment	4	3	4	2

14. a)	Determine the hamming bits for 12-bit data '101101101100' transmitted serially.	4	3	5	2
b)	Describe how both analog and digital signals may modulate a light transmitter.	4	1	4	1
15. a)	Write the advantages and disadvantages of FM over AM.	4	2	3	1
b)	Describe about internal and external sources of noise.	4	1	3	1
16. a)	Analyze and Compare the performance parameters of ASK, FSK and PSK techniques.	4	4	4	2
b)	Write advantages and disadvantages of microwaves.	4	2	6	1
17.	Answer any <i>two</i> of the following:				
a)	Discuss pre-emphasis and de-emphasis techniques in FM	4	1	3	1
b)	Describe the principle of frequency division multiplexing with the help of block diagram.	4	1	4	1
c)	Explain the operation of cyclic redundancy check with an example	4	2	5	1

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

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	70
2	Knowledge on application and analysis (Level-3 & 4)	30
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	---

