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**B.E. / B.TECH. DEGREE EXAMINATIONS, DEC 2019**

Third Semester

**EC16351 – ANALOG AND DIGITAL COMMUNICATION***(Common to CS & IT)***(Regulation 2016)****Time: Three Hours****Maximum : 100 Marks**Answer **ALL** questions**PART A - (10 X 2 = 20 Marks)**

		<b>CO</b>	<b>RBT</b>
1.	An AM transmitter radiates 10 KW without modulation and 15 KW after modulation. Calculate the depth of modulation.	<b>1</b>	<b>AP</b>
2.	Define frequency deviation in FM.	<b>1</b>	<b>R</b>
3.	Calculate the minimum Nyquist Bandwidth required for ASK, FSK & BPSK.	<b>2</b>	<b>AP</b>
4.	Draw the phasor diagram of 8-QAM and 16-QAM.	<b>2</b>	<b>AP</b>
5.	Define Nyquist Sampling Theorem.	<b>3</b>	<b>R</b>
6.	Compare PAM and PWM.	<b>3</b>	<b>AN</b>
7.	Calculate entropy of source alphabet {S <sub>0</sub> , S <sub>1</sub> , S <sub>2</sub> } with probabilities {1/4, 1/2, 1/4}.	<b>4</b>	<b>AP</b>
8.	Describe cyclic code.	<b>4</b>	<b>U</b>
9.	Define frequency reuse.	<b>5</b>	<b>R</b>
10.	List the applications of Bluetooth.	<b>5</b>	<b>AP</b>

**PART B - (5 X 16 = 80 Marks)**

11. (a) Derive the expression for instantaneous voltage of AM wave. Also write the advantages of FM over AM. **(16)**

**(OR)**

- (b) Explain the phase discrimination method for generation of SSB signals with relevant mathematical analysis. **(16)**

12. (a) Draw suitable diagrams and explain the operation of QPSK modulator and demodulator. Also explain the bandwidth considerations for QPSK system. **(16) 2 AP**

**(OR)**

- (b) (i) Illustrate the concept of 8-QAM transmitter. **(8) 2 AP**  
(ii) Compare BPSK, QPSK, 8-PSK and 16-PSK modulation schemes in terms of bandwidth and efficiency. **(8) 2 AP**

13. (a) With neat block diagrams explain the transmitter and receiver of Pulse Code Modulation (PCM) system. **(16) 3 AP**

**(OR)**

- (b) Explain the various Error Detection techniques and Error Correction Techniques. **(16) 3 AP**

14. (a) Mention the source coding theorem. Consider five messages  $S_0, S_1, S_2, S_3, S_4$  given by the probabilities  $1/2, 1/4, 1/8, 1/16, 1/16$ . Use Shannon –Fano algorithm and Huffman coding algorithm to develop an efficient code. Compare the coding efficiency. **(16) 4 AP**

**(OR)**

- (b) Illustrate and explain Viterbi Decoding algorithm. **(16) 4 AP**

15. (a) Explain the system architecture of GSM with necessary diagrams. **(16) 5 U**

**(OR)**

- (b) Write short notes on Satellite Communication and Bluetooth. **(16) 5 U**