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**Question Paper Code : 91410**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

Fifth Semester

Electrical and Electronics Engineering

EC 2311/EE 54/10144 EE 501— COMMUNICATION ENGINEERING

(Regulation 2008/2010)

(Common to PTEC 2311 – Communication Engineering for B.E. (Part–Time)

Fifth Semester – Electrical and Electronics Engineering – (Regulation 2009)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. A transmitter radiates 9 KW with the carrier unmodulated and 10.125 KW when carrier is sinusoidally modulated. Calculate the modulation index.
2. Why is VSB preferred for TV video transmission?
3. Draw the block diagram of an Adaptive modulator.
4. What are the two primary differences between MSK and QPSK?
5. An analog signal is band limited to BHz, sampled at the Nyquist rate, and the samples are quantized into 4 levels. The Quantization levels  $Q_1, Q_2, Q_3$  and  $Q_4$  are assumed to be independent and occur with probabilities  $P_1 = P_4 = \frac{1}{8}$  and  $P_2 = P_3 = \frac{3}{8}$ . Find the information rate of the source.
6. List the properties of Hamming distance.
7. What are the popular coding sequences of CDMA system?
8. Give out the merits of TDMA system.
9. Briefly comment on the aperture actuators used in satellite.
10. What is SCADA?

PART B — (5 × 16 = 80 marks)

11. (a) Name the methods used for the suppression of unwanted side band in AM transmission? Discuss the working of any one of them.

Or

- (b) (i) Compare the features of FM with AM. Also write the merits and demerits of FM. (6)  
(ii) Discuss the Armstrong method of FM generation. (10)
12. (a) (i) Discuss on the process “companding” and its characteristics. (6)  
(ii) How does Flat top sampling differ from natural sampling? Illustrate also obtain the filtered output? (10)

Or

- (b) Explain QPSK with a block diagram and spectrum. Also discuss the phasor diagram for sinusoids.
13. (a) For the given 8 bit stream 11010100, plot the NRZ, RZ, AMI, HDBP, differential Manchester codes.

Or

- (b) Discuss the viterbi algorithm by showing the possible paths through the trellis of a coder. Assume the state diagram of any coder.
14. (a) 500 users employ FDMA to transmit 1000-bit packets of data. The channel bandwidth is 100 MHz and QPSK is used at each of the 500 carrier frequencies employed
- (i) What is the maximum bandwidth allocated to each user?  
(ii) What is the bit rate employed by each user?  
(iii) How long does it take to transmit a packet?

Or

- (b) Draw a typical TDMA system. Explain the operation with the time pattern.
15. (a) Discuss broadly on the multiple access techniques used in satellite communication.

Or

- (b) Describe the following.
- (i) Optical detectors and their types.  
(ii) Satellite types.  
(iii) Digital filters used in satellite systems.  
(iv) Optical link.