Reg. No. :

Question Paper Code : X 20455

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020
Sixth Semester
Electronics and Instrumentation Engineering
EC 6651 – COMMUNICATION ENGINEERING
(Common to Electrical and Electronics Engineering/Instrumentation and Control
Engineering)
(Regulations 2013)

Time : Three Hours   Maximum : 100 Marks

Answer ALL questions

PART – A   (10×2=20 Marks)

1. Define Narrowband FM.

2. What is the difference between VSB and SSB modulations ?

3. Why flat top PAM is preferred over natural PAM ?

4. What is slope overload error ?

5. State channel capacity theorem.

6. Mention the significance of Hamming Distance.

7. What is CDMA ?

8. Why is multiple access required ?

9. What are the different types of satellites ?

10. Write about aperture actuators used in satellite.

PART – B   (5×13=65 Marks)

11. a) Explain the generation of DSB-SC wave using Balanced Modulator. Derive the
        power of DSB-SC signal.

                          (OR)

    b) Explain in detail about indirect method of FM generation.

12. a) With the neat sketch of transmitter and receiver, explain the operation of delta modulation and list its merits and demerits.

(OR)

b) i) Illustrate the sampling of lowpass signals using suitable spectral plots. **(5)**

ii) Discuss the QPSK modulation scheme with transmitter and receiver block diagrams. **(8)**

13. a) i) The probabilities of the five possible outcomes of an experiment are given as $P(x_1) = 1/2$, $P(x_2) = 1/4$, $P(x_3) = 1/8$, $P(x_4) = P(x_5) = 1/16$. Determine the entropy and information rate if there are 16 outcomes per second. **(7)**

ii) Encode the binary data stream : 1110110001011 into NRZ, RZ and AMI. **(6)**

(OR)

b) i) Describe the usage of automatic repeat request for low error rates and also brief its performance. **(7)**

ii) For a (6, 3) code, the generator matrix is given as :

$$G = \begin{pmatrix} 1 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{pmatrix}$$

1) Realize an encoder for this code.
2) Verify that this code is a single error-correcting code.
3) If the received code word is 100011, find the syndrome. **(6)**

14. a) i) With a sketch, describe the TDMA scheme. **(3+4)**
ii) What is the concept of SDMA technique ? With relevant sketch, describe the same. **(6)**

(OR)

b) i) Describe an FDMA scheme with relevant sketch(es). **(7)**
ii) Describe a CDMA scheme with respective sketches. **(6)**

15. a) Discuss briefly the Multiple access techniques used in satellite communications.

(OR)

b) Write short notes on :
i) Optical sources and detection. **(7)**
ii) SCADA. **(6)**

PART – C **(1×15=15 Marks)**

16. a) Analyse the advantages of delta modulation. How is it different from adaptive delta modulation ? Justify. **(7+8)**

(OR)

b) Compare and contrast GMSK versus MSK and discuss on the advantages and disadvantages of both the techniques. **(7+8)**

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