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Question Paper Code : P 1262

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2009.

Fifth Semester

Electrical and Electronics Engineering

(Regulation 2004)

EC 1311 — COMMUNICATION ENGINEERING

(Common to Electronics and Instrumentation Engineering and Instrumentation and Control Engineering)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   State the advantage of FM over AM.

2.   A carrier signal with power of 40 watts is amplitude modulated by a sinusoidal signal. Find the power of the modulated signal if the modulation index is 0.7.

3.   Define standing wave ratio.

4.   Define the critical frequency.

5.   Give the significance of T carrier system in communication networks with an illustration.

6.   Compare the performance of FSK and PSK based on the power and bandwidth efficiency.

7.   Describe the role of modem in communication networks.

8.   How many errors can be detected and corrected by a (7,4) Hamming code?

9.   List the advantages and disadvantages of geosynchronous satellites.

10.   Determine the carrier to noise density ratio for a receiver with-70 dBW input carrier power, an equivalent noise temperature of 180 degree K and a band width of 20 MHz.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the operation super heterodyne receiver by comparing its performance with TRF receiver. (12)

    (ii) What is meant by image frequency rejection? Calculate the image frequency at 1000 kHz, for an AM receiver. (4)

Or

   (b) (i) Explain the envelope detector circuit used for AM demodulation. (8)

    (ii) With a neat block diagram explain the frequency division multiplexing applied in AM broadcast. (8)

12. (a) (i) Explain the surface wave propagation of electromagnetic waves. (6)

    (ii) Derive the free space path loss experienced by an electromagnetic wave. Determine the free space path loss incurred by a signal at 10 GHz, when it travels a distance of 100 km. (10)

Or

   (b) Draw the electrical equivalent circuit of two wire parallel transmission line. Explain the transmission characteristics and its associated losses.

13. (a) (i) Draw the block diagram of BFSK transmitter and receiver. Explain the same digital modulation scheme with appropriate constellation diagram. (13)

    (ii) Determine the maximum bit rate for an FSK signal with mark frequency of 48 kHz, a space frequency of 52 kHz and available bandwidth of 10 kHz. (3)

Or

   (b) (i) Draw the block diagram of a PCM communication system. Explain the function of each block with neat sketch of input and output at each stage. (12)

    (ii) A speech signal generated by a voice source is sampled at a rate of 8 kHz and a uniform quantizer of 256 levels is used to quantize the signal. Determine the output data rate required if the Nyquist rate of sampling is used. (4)

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14. (a) Explain the ISO-OSI layered architecture with the functionalities of each layer.

Or

(b) (i) Describe the physical, electrical and operational characteristics of RS 232C serial Interface. (10)

(ii) Write an brief account on ISDN networks. (6)

15. (a) (i) Derive the satellite system link equation. (12)

(ii) Briefly describe the losses associated with fiber optical communication systems. (4)

Or

(b) (i) List the advantages of using optical fiber as a medium of communication in a telephone network. (6)

(ii) Draw the block diagram of fiber optical communication link. Explain the principle of operation of light sources and detectors. (10)

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