G 1585

(Pages : 2)

Reg. No.................................

Name.....................................
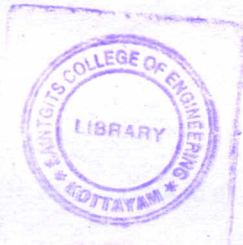
B.TECH. DEGREE EXAMINATION, MAY 2015

Fourth Semester

Branch : Electronics and Communication/Applied Electronics and Instrumentation/Electronics and Instrumentation Engineering

COMMUNICATION ENGINEERING—I (L, A, S)

(Old Scheme—Prior to 2010 Admissions)

[Supplementary/Mercy Chance]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.
Each question carries 4 marks.

1. Explain the need for modulation in Electronic communications.

2. Define, compare and contrast between AM and FM indices.

3. Define and differentiate between the high level and low level AM.

4. Explain how the pre-emphasis and de-emphasis networks improve the noise performance of the receiver.

5. What is the function of the balanced modulator in the Armstrong modulation systems ?

6. Explain how the use of RF amplifier improves the signal-to-noise ratio of a superhet receiver.

7. What do you mean by companding ? What are its advantages ?

8. Describe a pilot carrier system.

9. Distinguish between pulse and tone dialling.

10. What is DTMF ? What are its merits ?

(10 × 4 = 40 marks)

Part B

Answer all questions.
Each full question carries 12 marks.

11. A 500 W, 800 kHz carrier is amplitude modulated by two sine waves of 220 Hz and 2.2 kHz to depths of 40% and 50% respectively. Calculate the :

    (i)   total power transmitted ;

    (ii) each side band power ;

    (iii) total bandwidth of the modulated wave; and

    (iv) Draw the spectrum of the above modulated wave.

Or

Turn over

12. Starting from fundamentals, derive expression for an FM wave and identify the frequency components present in it. Discuss its spectrum.

13. Draw the complete block diagram of the Armstrong frequency modulator system and explain the function of the mixer and multiplier shown. In what circumstances can we dispense with the mixer ?

Or

14. With appropriate circuit diagrams, explain the principle of operation of base modulated and collector modulated AM generators.

15. Describe the circuit diagram of a mixer used with an AM receiver and explain its working when the receiver is tuned to a radio station of 620 kHz.

Or

16. Using circuit diagrams, show how the Foster-seely discriminator is derived form the balanced slope detector, and how in turn, the ratio detector is derived from the discriminator. In each step stress the common characteristics, and show what it is that makes each circuit different from the previous one.

17. Use a circuit diagram to help in an explanation of how a balanced modulator is able to demodulate SSB signals.

Or

18. Compare the three main systems of SSB generation by drawing up a table of the outstanding characteristics of each system.

19. With a neat block diagram, explain the operation of a single line analog SLIC board.

Or

20. With neat diagrams, explain how scanning of an image is done in the FAX transmitter ? How it is communicated through telephone line and how the image is recovered at the receiver ?

$(5 \times 12 = 60$ marks$)$