

**B.E. (Electronics Engineering / Electronics Telecommunication /
Electronics Communication Engineering) Semester Fifth (C.B.S.)**

Communication Electronics

P. Pages : 2

Time : Three Hours



KNT/KW/16/7326/7331

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Due credit will be given to neatness and adequate dimensions.
 9. Assume suitable data wherever necessary.
 10. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Derive an expression for amplitude modulated wave. Draw necessary waveforms. 8
- b) Calculate the percentage power saving when carrier and one of the side bands are suppressed in an AM modulated to a depth of (i) 75% (ii) 50% 6

OR

2. a) What are the different methods of SSB - SC generation? Explain any one method in detail. 7
- b) Draw & explained balanced modulator using diodes. And also do its mathematical analysis. 7
3. a) What is Frequency modulation? Derive an expression for the instantaneous value of FM signal. 7
- b) A FM wave is represented by the voltage equation 6

$$V = 10 \sin [2 \times 10^8 t + 5 \sin 2000 t]$$

Find the carrier and modulating frequencies, the modulation index and maximum deviation in FM. Calculate the power dissipated by this FM wave in 10Ω resistor.

OR

4. a) Explain the working principle of Armstrong type of frequency modulator with simple diagram. 7
- b) Describe the relationship between FM and PM. 6
5. a) Explain Nyquist criteria. What happens when a signal is sampled at a rate less than Nyquist rate? 6

- b) How PPM can be achieved from PWM? Explain how PPM can be demodulated. 7

OR

6. a) For PCM system, describe the effects of 6
 i) increasing sampling rate
 ii) increasing the number of bits per sample.

- b) Explain in detail the Delta modulation technique. 7

7. a) What is noise? What are the various forms and sources of noise? 6

- b) The noise figure of an IF amplifier is 15 dBs. The amplifier is preceded by a pre - amplifier with a gain of 10 dBs and noise figure of 6 dBs. Find the overall noise figure. 7

OR

8. a) What is meant by the signal to noise ratio? Why is it important in communication systems. 5

- b) Derive an expression for noise figure for a two stage amplifier? 8

9. a) Explain the basic principle used in Superheterodyne Radio Receiver. What are the advantages of this receiver over TRF receiver? 7

- b) Calculate Image Rejection Ratio of a receiver having RF amplifier and IF of 450 KHz. If Q's of the relevant coil are 65 the incoming frequencies : 6
 i) 1200 KHz
 ii) 20 MHz

OR

10. a) Explain the working of square law diode detector circuit. 6

- b) Draw and describe the operation of Foster - Seeley discriminator. 7

11. a) Distinguish between Time Division Multiplexing and Frequency Division Multiplexing. 7

- b) Explain code division multiplexing. 7

OR

12. Describe the following Haul systems.

- i) Microwave link (RF link) 5

- ii) Submarine Cables 5

- iii) Tropospheric Scatter link. 4
