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

Communication Electronics

P. Pages : 2

Time : Three Hours

NKT/KS/17/7326/7331

Max. Marks : 80

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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. Assume suitable data whenever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.
10. Use of non programmable calculator is permitted.

1. a) Draw & Explain any SSB Modulation technique in detail, with its advantages and disadvantages. **7**

   b) Derive the expression for amplitude modulated wave. Also plot the frequency spectrum for various forms of amplitude modulation. **7**

OR

2. a) Explain Ring Modulator along with the waveforms. **7**

   b) An audio frequency signal $10\sin 2\pi 500t$ is used to amplitude modulate a carrier $50\sin 2\pi * 10^5 t$. Calculate - **7**
      i) Modulation index
      ii) Sideband frequencies and B.W.
      iii) Amplitude of each sideband.
      iv) Total power delivered to the load of 600π.

3. a) Find the carrier and modulating frequency, the modulation index, and maximum deviation of FM wave represented by equation $12.\sin(6*10^8 t + 5\sin 1250t)$ what power will this FM wave dissipate in 10Ω resistor. **7**

   b) Explain FM modulation process using varactor diode in detail. **6**

OR

4. a) An FM transmitter operates with a total power of 10 watt, a deviation of 5KHz and modulation index of 2. **6**
      1) What is modulating frequency
      2) How much power is transmitted at the carrier frequency.
      3) Sketch the spectrum of this signal to include first two sets of sidebands.

   b) Explain Armstrong method of FM generation in detail. **7**

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5.	a)	48 telephone channels each band limited to 3.4 KHz are to be time division multiplexed by using PCM. Calculate the bandwidth of PCM system for 128 quantization levels and 8KHz sampling frequency.	**6**
	b)	Explain delta modulation technique in detail. Also explain slope overload and granular noise in detail.	**7**

OR

6.	a)	Explain PWM generation using monostable multivibrator. Also give necessary wave forms.	**6**
	b)	Write down sampling theorem. Explain natural sampling and flat top sampling in detail.	**7**

7.	a)	Derive the equation of noise figure for two stage amplifier.	**7**
	b)	Write short notes on - i) Shot noise ii) Thermal noise	**6**

OR

8.	a)	First stage of two stage amplifier has a voltage gain of 10Ω, a 600Ω input resistance, 1600Ω equivalent noise resistance and $27\,\text{k}\Omega$ output resistance, for second stage these values are 25, $81\,\text{k}\Omega$, $10\,\text{k}\Omega$ and $1\text{M}\Omega$ respectively. Calculate equivalent input noise resistance for two stage amplifier.	**7**
	b)	Explain different types of noise in detail.	**6**

9.	a)	Explain superheterodyne receiver in detail.	**7**
	b)	Explain foster seely FM detector in detail.	**7**

OR

10.	a)	For a broadcast superheterodyne AM receiver having no RF amplifier, the loaded quality factor Q of the antenna coupling circuit is 100. Now if intermediate frequency is 455KHz, then determine the following - i) Image Frequency and its rejection ratio at incoming frequency of 1000 KHz. ii) Image frequency and its rejection ratio at incoming frequency of 25 MHz.	**7**
	b)	Explain envelope detector with the help of waveforms.	**7**

11.	a)	Explain with the help of neat diagram frequency division multiplexing.	**7**
	b)	Write short notes on - i) Microwave Links ii) Coaxial Cables iii) Submarine Cables	**6**

OR

12.	a)	Compare Time division multiplexing and Frequency division multiplexing in detail.	**7**
	b)	Write short notes on - CDMA.	**6**

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