

Fifth Semester B. E. (Electronics Engineering) (CGS) Examination

**COMMUNICATION ENGINEERING – II**

Paper – 5 XN 04

( USC – 10671 )

P. Pages : 3

Time : Three Hours]

[ Max. Marks : 80

- Note :** (1) Separate answer book must be used for each section in the subject Geology, Engineering material of Civil branch and separate answer book must be used for Section A and B in pharmacy and Cosmetic Tech.
- (2) Answer **Three** questions from Section A and **Three** questions from Section B.
- (3) Due credit will be given to neatness and adequate dimensions.
- (4) Assume suitable data wherever necessary.
- (5) Illustrate your answer wherever necessary with the help of neat sketches.
- (6) Use pen of Blue/Black ink/refill only for writing book.

**SECTION A**

1. (a) Define Amplitude Modulation. Derive the expression of AM wave. 7
- (b) Explain with neat block diagram any one method for suppression of unwanted sideband. 7

**OR**

2. (a) A modulating signal  $20 \sin (2 \pi \times 1000 t)$  is used to modulate a carrier signal  $80 \sin (2 \pi \times 1000 t)$ . Find the percentage modulation, frequencies of sideband components and their amplitudes. What is the BW of modulated signal ? Also draw the spectrum of AM wave. 7
- (b) Explain Balanced Modulator using FETs. Also derive the expression for the same. 7
3. (a) In a broadcast superhetrodyne receiver having no RF amplifier, the loaded Q of antenna coupling circuit is 100.
- (i) If the intermediate frequency is 455 KHz calculate image frequency and its rejection at 1000 KHz and at 25 MHz.

- (ii) In order to make the image frequency rejection of the receiver as good at 25 MHz as it was at 1000 KHz, calculate the loaded Q which an RF amplifier for this receiver would have. 6
- (b) Why AGC is required in receivers ? Explain Delayed AGC circuit. 7

OR

4. (a) List the characteristics of AM Receiver and explain any three of them. 6
- (b) Draw and explain the block diagram of Double Conversion Receiver. 7
5. (a) Define frequency modulation and its modulation index. Design an equation for instantaneous value of FM voltage. 7
- (b) Explain Pre-emphasis and De-emphasis. 6

OR

6. (a) Compare Wide band and Narrow band FM. 5
- (b) The center frequency of an LC oscillator to which a capacitive reactance FET modulator is connected is 70 MHz. The FET has a  $g_m$  which varies linearly from 1 to 2 ms and a bias capacitor whose reactance is 10 times the resistance of bias resistor. If the fixed tuning capacitance across oscillator coil is 25 pf. Calculate maximum frequency deviation produced. 8

### SECTION B

7. (a) Draw and explain the block diagram of FM receiver. 6
- (b) What is the role of FM discriminator in FM receiver. Explain with the help of circuit diagram and response characteristics the operation of slope detector. 8

OR

8. (a) Explain Foster Seelay discriminator with neat circuit diagram. 8
- (b) Explain Amplitude Limiter in FM. 6

9. (a) Explain Delta Modulation process with neat diagram. 7  
(b) What is Flat Top Sampling ? Also explain what is aperture effect. 6

**OR**

10. (a) Explain pulse width modulation and demodulation process. 6  
(b) State and prove the sampling theorem. 7
11. (a) Draw and explain the block diagram of centralized SPC. 6  
(b) Explain pulse dialing system. 7

**OR**

12. (a) Explain Time division time switching. 6  
(b) Explain the functioning of distributed SPC in different modes. 7

