

B.E. Fourth Semester (Four Year) (Electronics & Telecommunication) (New) (CGS)
Communication Engineering - I : 4 ET 05

P. Pages : 2

Time : Three Hours



AU - 2591

Max. Marks : 80

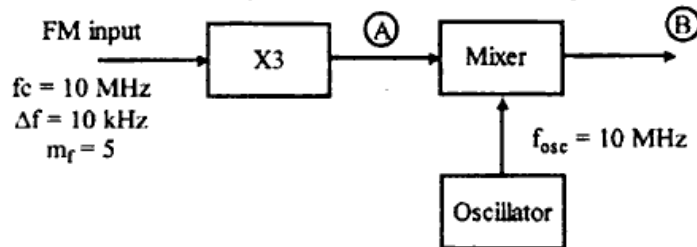
- Notes :
1. All question carry equal marks.
 2. Answer **three** question from Section A and **three** question from Section B.
 3. Due credit will be given to neatness and adequate dimensions.
 4. Assume suitable data wherever necessary.
 5. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION - A

1. a) Derive the power relationship for an AM wave with its transmission efficiency. Also calculate power saving achieved with SSB-SC over DSB-SC for $m = 100\%$ 9
b) Explain the need of modulation. 4

OR
2. a) Explain filter method for SSB-SC signal generation. 5
b) Draw and explain balanced modulator using FET and hence mathematically prove that:
i) Carrier is completely suppressed.
ii) Output of balanced modulator consist of both sidebands. 8
3. a) Explain characteristics of communication receiver in brief any three. 6
b) Sketch circuit diagram of practical diode detector and explain its operation. How is AGC obtained from this detector? 7

OR
4. a) Draw and explain block diagram of superheterodyne with relevant waveforms at output of each block. 8
b) Explain distortion present in AM envelope diode detection in detail. 5
5. a) Explain direct method of FM generation any one. 6
b) In block diagram below, find out carrier frequency, frequency deviation and modulation index at point A and B. Assume output of mixer to be sum component only. 8



OR

6. a) Explain FM generation using Armstrong method. 8
b) Compare and contrast AM, FM and PM. 6

SECTION - B

7. a) Sketch circuit diagram of ratio detector and explain how it demodulated FM signal. 7
b) Explain stereo FM receiver in detail. 5
c) If RF amplifier of receiver has resonant frequency of 1.5MHz and loaded Q factor is 75. Calculate required bandwidth. 2

OR

8. a) Explain operation of balanced slope detector with help of circuit diagram and its characteristics. What are its drawback? 8
b) Write a short note on: 6
i) Pre-emphasis ii) De-emphasis
9. a) Explain the following in brief any three. 9
i) SWR ii) Characteristic of impedance
iii) BALUN iv) Stub
b) For a transmission line having characteristics impedance of 75Ω . Calculate per unit length inductance if nominal capacitance is 69pF/m . Now if nominal capacitance of transmission line changes to 72pF/m calculate new value of inductance/m. 4

OR

10. a) Derive an expression for characteristic impedance. 9
b) What is Smith chart? State its application. 4
11. a) Explain design of Yagi-Uda antenna upto 5 elements in brief. 5
b) Define the following. 8
i) Radiation resistance of antenna.
ii) Principle of radiation.
iii) Beam width & Polarization
iv) Antenna power gain.

OR

12. a) Explain log periodic antenna and rhombic antenna in detail. 8
b) Draw and explain parasitic reflector and parasitic director with respect to Yagi-Uda antenna. 5
