

SANT GADGE BABA MARAVATI UNIVERSITY, AMRAVATI Summer Examination 202 Credit Point0 HVPM's College of Engineering and Technology, Amravati Department of Electronics & Tele Communication Engineering Bachelor of Engineering Sem:-IV

Subject:-Communication Engineering

Code:-4ET05

Instructions:-

1) Solve any two questions

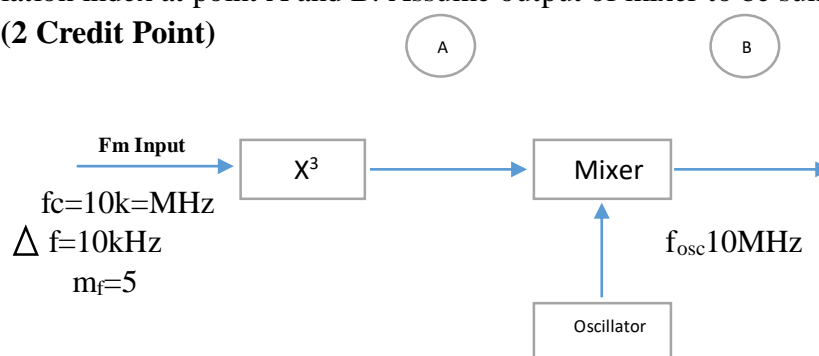
2) All question carry equal marks

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 $m = 100\%$. **(2 Credit Point)**
- b) Explain! Characteristics of communication receiver in brief any three. **(2 Credit Point)**
- c) Explain direct method of FM generation any one **(2 Credit Point)**
- d) Sketch circuit diagram of ratio detector and explain how it demodulated FM signal. **(2 Credit Point)**
- e) Explain the following in brief any three. **(1 Credit Point)**
 - i) SWR ii) Characteristic of impedance iii) Stub iv) Balun
- f) Explain design of Yagi-Uda antenna up to 5 elements in brief. **(1 Credit Point)**

2.

- a) Explain the need of modulation. **(2 Credit Point)**
- b) Sketch circuit diagram of practical diode detector and explain its operation. How is AGC obtained from this detector? **(2 Credit Point)**
- c) 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. **(2 Credit Point)**



- d) Explain stereo FM receiver in detail. **(2 Credit Point)**
- e) For a transmission line having characteristics impedance of 75Ω . Calculate per unit length inductance if nominal capacitance is 69 pF/m . Now if nominal capacitance of transmission line changes to 72 pF/m calculate new value of inductance/m. **(1 Credit Point)**
- f) Define the following. **(1 Credit Point)**
 - i) Radiation resistance of antenna. ii) Principle of radiation.
 - iii) Beam width & Polarization iv) Antenna power gain.

3.

- a) Explain filter method for SSB-SC signal generation. **(2 Credit Point)**
- b) Draw and explain block diagram of super heterodyne with relevant waveforms at output of each block. **(2 Credit Point)**
- c) Explain FM generation using Armstrong method. **(2 Credit Point)**
- d) Explain operation of balanced slope detector with help of circuit diagram and its characteristics. What are its drawbacks? **(2 Credit Point)**
- e) Derive an expression for characteristic impedance. **(1 Credit Point)**
- f) Explain log periodic antenna and rhombic antenna in detail. **(1 Credit Point)**

4.

- a) Draw and explain balanced modulator using FET and hence. Mathematically prove that: **(2 Credit Point)**
 - i) Carrier is completely suppressed.
 - ii) Output of balanced modulator consist of both sidebands.
- b) Explain distortion present in AM envelope diode detection in detail. **(2 Credit Point)**
- c) Compare and contrast AM, FM and PN. **(2 Credit Point)**
- d) Write a short note on: **(2 Credit Point)**
 - i) Pre-emphasis ii) De-emphasis
- e) What is Smith chart? State its application. **(1 Credit Point)**
- f) Draw and explain parasitic reflector and parasitic director with respect to Yagi- Uda antenna. **(1 Credit Point)**