CBCS SCHEME

USN ☐☐☐☐☐☐☐☐☐☐

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Principles of Communication System

Time: 3 hrs.   Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1   a. Explain in detail the working of switching modulator with diagram and necessary derivations. **(10 Marks)**
    b. Explain the generation of DSBSC modulated waves using ring modulator. **(10 Marks)**

OR

2   a. Illustrate the amplitude modulation process and draw the waveform for modulation index $M > 1$ & $M < 1$. **(08 Marks)**
    b. Explain with relevant block diagram and working of FDM system. **(08 Marks)**
    c. A 400 W carrier is modulated on a depth of 75 percent. Calculate the total power in the modulated wave of following form AM.
       (i) Double Side Band with Full Carrier (DSBFC)
       (ii) Double Side Band Suppressed Carrier (DSBSC) **(04 Marks)**

Module-2

3   a. Derive the equations for frequency modulated wave. Define modulation index and frequency deviation. **(12 Marks)**
    b. A 93.2 MHz carrier is frequency modulated by 5 kHz sine wave the resultant FM signal has frequency deviation of 40 kHz:
       (i) Find the carrier swing of FM signal
       (ii) What are highest and lowest frequencies of FM signal?
       (iii) Calculate the modulation index of FM
       (iv) B.W of FM signal **(08 Marks)**

OR

4   a. Explain the Narrow band FM with relevant expressions and phasor diagrams. **(10 Marks)**
    b. Discuss the nonlinear effects in FM system. **(06 Marks)**
    c. Assume that the maximum value of frequency deviation Δf is fixed at 50 kHz for a certain FM transmission. Given that the maximum modulating frequency is 15 kHz. Calculate the necessary transmission bandwidth. **(04 Marks)**

Module-3

5   a. Derive the expression for figure of merit for DSB-SC receiver. **(10 Marks)**
    b. Find figure of merit for single tone FM. **(06 Marks)**
    c. Write short notes on:
       (i) Shot Noise
       (ii) White Noise **(04 Marks)**