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NA—93—2023

FACULTY OF SCIENCE

B.Sc. (Third Year) (Fifth Semester) EXAMINATION

NOVEMBER/DECEMBER, 2023

(New/CBCS Pattern)

ELECTRONICS

Paper XII

(Communication Electronics–I)

(Tuesday, 19-12-2023) **Time : 10.00 a.m. to 12.00 noon**

Time—Two Hours *Maximum Marks*—40

N.B. :— All questions are compulsory.

1. Draw the block diagram of basic communication system and explain function of each block. Describe the types of modulation systems. 15

Or

(*a*) A modulating signal $10 \sin (2\pi \times 10^3 t)$ is used to modulate a carrier signal $20 \sin (2\pi \times 10^3 t)$. Find the modulation index, percentage modulation, frequencies of sideband components and their amplitudes and bandwidth of modulated signal. 8

(*b*) Draw and describe the frequency spectrum of AM wave. In AM, the modulating signal frequency is 10 kHz and carrier signal frequency is 1 MHz. Determine the frequencies of USB and LSB. 7

P.T.O.

2. Explain the principle of generation of FM. Describe the basic reactance modulator using FET with its mathematical analysis. Draw the diagram of capacitive and inductive reactance modulators using FET. 15

Or

(*a*) What is sampling process ? Describe sampling theorem and Nyquist criteria. 8

(*b*) State the applications, advantages and disadvantages of PCM. 7

3. Write short notes on (any *two*) : 10

(*a*) Need of modulation

(*b*) Amplitude demodulator circuit

(*c*) Varactor reactance modulator

(*d*) PCM transmitter.