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PA—17—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(New/CBCS Pattern)

PHYSICS

Paper–XV

(Digital and Communication Electronics)

(Wednesday, 10-04-2024) **Time : 10.00 a.m. to 12.00 noon**

Time—2 *Hours* *Maximum Marks*—40

N.B. *:—* (*i*) *All* questions are compulsory.

(*ii*) Figures to the right side indicate full marks.

(*iii*) Use of non-programmable calculator is allowed.

1. Draw a logic circuit diagram of full adder with its truth table. Hence draw K-map for outputs S_n and C_n. 15

P.T.O.

Or

(*a*) Convert the following numbers :

(*i*) $(101111)_2 = (\quad)_{10}$

(*ii*) $(6571)_8 = (\quad)_2$

(*iii*) $(9624)_{10} = (\quad)_{16}$

(*iv*) $(DE94)_{16} = (\quad)2$ 8

(*b*) Perform the following :

(*i*) 0111011 + 0011111

(*ii*) 10111 — 01101

(*iii*) 110001 × 111

(*iv*) 1110101 ÷ 1001. 7

2. What are the types of modulation ? Derive an expression for frequency modulated voltage. Draw the waveforms. 15

Or

(*a*) Draw the block diagram of Tuned Radio Frequency (TRF) receiver. Explain function of each block. 8

(*b*) Explain characteristics of radio receiver : selectivity, sensititivity, fidelity. 7

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

(*a*) BCD code

(*b*) AND, OR and NOT gates

(*c*) Power output in AM.

(*d*) Basic communication system.