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NA—17—2023

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2023

(CBCS/New Pattern)

PHYSICS

Paper—XV

(Digital and Communication Electronics)

(Wednesday, 6-12-2023)

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 the logic symbols, logic equations and truth tables for OR, AND, NOT, NAND and EX-OR logic gates. 15

Or

(a) Perform the following arithmetics of the given numbers : 8

(i) $1011 + 1001$

P.T.O.

- (ii) $1010 - 111$
- (iii) 110001×1110101
- (iv) $1111101 \div 101.$
- (b) Explain Gray and Excess-3 codes. 7
2. Derive an expression for amplitude modulated wave in terms of modulation index with corresponding wave forms. Explain frequency spectrum of AM wave. 15
- Or*
- (a) Draw the block diagram of superheterodyne radio receiver. Explain function of each block. 8
- (b) Draw block diagram of basic communication system and explain function of each. 7
3. Write short notes on any *two* : 10
- (a) Hexadecimal number system
- (b) Half adder
- (c) Linear diode AM detector
- (d) AM receiver.