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SA—17—2025

FACULTY OF SCIENCE

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

APRIL/MAY, 2025

PHYSICS

(Digital and Communication Electronics-XV)

(Friday, 11-4-2025) **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 indicate full marks.

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

1. What is gate ? Explain AND, OR and NOT gates with their logic symbols, Boolean equations and truth tables. 15

Or

(*x*) Carry out the following arithmetic : 8

(*a*) $(0110111)_2 + (001111)_2$

(*b*) $(10111)_2 - (01101)_2$

(*c*) $(110001)_2 \times (1110101)_2$

(*d*) $(1110101) \div (1001)_2$

(*y*) Discuss excess 3 code and gray code. 7

P.T.O.

2. What are the types of modulations ? Derive an expression for frequency modulated wave. 15

Or

(*x*) Draw block diagram of basic communication system. Explain each block. 8

(*y*) Explain characteristics of radio receiver : 7

(*i*) Selectivity

(*ii*) Sensitivity

(*iii*) Fidelity.

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

(*a*) Universal properties of NAND gate

(*b*) De-Morgan's theorems

(*c*) Essential elements of A.M. transmitter

(*d*) Linear diode A.M. detector.