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VA—17—2024

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2024

(CBCS/New Pattern)

PHYSICS

Paper–XV

(Digital and Communication Electronics)

(Tuesday, 3-12-2024) **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 indicate full marks.

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

1. Define gate. Discuss basic gates with their logic symbols, boolean equations and truth tables. 15

Or

(*x*) Convert the following : 8

(*a*) $(598)_{10} = (?)_2$

(*b*) $(4AB)_{16} = (?)_{10}$

(*c*) $(1101011)_2 = (?)_8$

(*d*) $(451)_8 = (?)_2$.

P.T.O.

(*y*) Plot K-map and find out reduced Boolean expression for

$f(ABCD) = \sum M(0, 1, 4, 5, 11, 14, 15)$. 7

2. Define modulation. Obtain an expression for amplitude modulated voltage in terms of modulation index and explain frequency spectrum of A.M. wave. 15

Or

(*x*) Draw block diagram of superheterodyne radio receiver and explain function of each block. 8

(*y*) Discuss linear diode detector with a neat diagram. 7

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

(*a*) XS-3 code

(*b*) Half Adder

(*c*) TRF receiver

(*d*) Power in A.M.