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R—97—2017

FACULTY OF SCIENCE

B.Sc. (Sixth Sem.) EXAMINATION

MARCH/APRIL, 2017

(New Course)

PHYSICS

Paper XV (A)

(PHY-305)

(Digital and Communication Electronics)

(Friday, 7-4-2017)

Time : 10.00 a.m. to 12.00 noon

Time—Two Hours

Maximum Marks—40

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

(ii) All questions carry equal marks.

1. Attempt any *four* :

8

- (a) Define amplitude modulation.
- (b) State AND Law.
- (c) Explain position weighted number system.
- (d) Define selectivity of a radio receiver.
- (e) Give truth table of NAND gate.
- (f) Define Hexadecimal number system.
- (g) Give statement of deviation ratio.
- (h) Define fidelity of a radio receiver.

2. Attempt any *two* :

8

(a) Perform the following conversions :

$$(654)_8 = (?)_2$$

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

$$(10101)_2 = (?)_{10}$$

$$(A5D)_{16} = (?)_2$$

P.T.O.

- (b) Draw symbols of two input EX-OR and EX-NOR gates. Write their truth tables.
- (c) Obtain an expression for A.M. voltage.
3. Attempt any *two* : 8
- (a) Give construction of basic gates using NAND gate.
- (b) Explain, in detail, gray code.
- (c) Discuss super-heterodyne receiver using its well labelled diagram.
4. Attempt any *one* : 8
- (a) Give types of modulations. Derive an expression for frequency modulated voltage.
- (b) What is need of modulation in communication system. Draw block diagram of TRF reciever and explain each block.
5. Write short notes on (any *two*) : 8
- (a) Universal properties of NAND gate
- (b) Binary number system
- (c) AND gate, OR gate and NOT gate
- (d) Sum of weights method for decimal to binary conversion with two suitable examples.