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B—121—2019

FACULTY OF SCIENCE

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

MARCH/APRIL, 2019

(CGPA Pattern)

PHYSICS

Paper-XV-A (PHY-305)

(Digital and Communication Electronics)

(Tuesday, 2-4-2019)

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.

1. Attempt any four : 8

- (a) Find minterms for $Y = A + BC$.
- (b) State commutative law.
- (c) What are the functions of input and output transducers in basic communication system ?
- (d) Define selectivity and fidelity of a radio receiver.
- (e) Give the statement of deviation ratio.
- (f) Write the mathematical expression for modulation index.
- (g) Solve the following binary multiplications :
 - (i) $(101)_2 \times (110)_2$
 - (ii) $(1100)_2 \times (1101)_2$
- (h) Explain position weighted number system.

2. Attempt any two : 8

- (a) Convert the following decimal numbers to binary numbers :
 - (i) 122.56
 - (ii) 29.3
 - (iii) 15.4
 - (iv) 26.2

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- (b) Draw truth table and logic symbol for EX-NOR gate. Explain its working.
 (c) Explain in detail principle of demodulation. Draw the circuit diagram.

3. Attempt any two : 8

- (a) Find the truth table and construct K-map for the following SOP equation :

$$C = \overline{A}\overline{B} + A\overline{B}$$

- (b) Define sensitivity. Write procedure to measure sensitivity.
 (c) Draw a neat labelled diagram of linear diode detector and explain working.

4. Attempt any one : 8

- (a) Draw the block diagram of basic communication system and explain function of each.
 (b) Explain FM. Draw wave forms and obtain an expression for frequency modulation.

5. Attempt any two : 8

- (a) Discuss universal properties of NAND gate.
 (b) Describe communication system using modulation.
 (c) Explain in detail gray code.
 (d) Perform the following conversions :

(i) $(2480)_{10} = (?)_{16}$

(ii) $(110111)_2 = (?)_{10}$

(iii) $(356)_{10} = (?)_8$

(iv) $(57)_8 = (?)_2$

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