P-110

Total Pages : 3   Roll No. ....

MSCPH-521

Digital Electronics and Communication System

M.Sc. Physics (MSCPH)

3rd Semester Examination, 2023 (June)

Time : 2 Hours]   **Max. Marks : 70**

Note : This paper is of Seventy (70) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein. Candidates should limit their answer to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

SECTION–A
(Long Answer Type Questions)

Note : Section 'A' contains Five (05) long answer type questions of Nineteen (19) marks each. Learners are required to answer any Two (02) questions only.

$$(2\times19=38)$$

1. What is Boolean algebra? Give fundamental laws of Boolean algebra. Prove the following Boolean identity.

$$(A + B)(A + C) = A + BC$$

2. Explain the functioning of Encoder and decoder along with truth tables.

3. Explain any *two* of the following :

(a) Shift Register.

(b) Synchronous counters.

(c) Ring Counter.

4. What is frequency modulation? Explain the principal of reactance tube modulator.

5. Explain any *two* of the following :

(a) Loop Antenna.

(b) Yagi Antenna.

(c) Dish Antenna.

SECTION–B
(Short Answer Type Questions)

Note : Section 'B' contains Eight (08) short answer type questions of Eight (08) marks each. Learners are required to answer any Four (04) questions only. (4×8=32)

1. (a) Convert hexadecimal number $(ABCD)_{16}$ to decimal.

(b) Subtract 01111 from 11011.

2. Explain NAND and NOR Gate. Why NAND gate is called universal gate?

3. Describe the working of R-S flip flops. What are its disadvantages?

4. Implement the foBowing functions using logic gates

$$\overline{AB} + (A + B)$$

5. Discuss R- 2R ladder circuit.

6. The peak voltage of an AM signal varies from 2 V to 10 V (assume sinusoids). Find the total power and power efficiency.

7. Explain the working of vidicon with suitable diagram.

8. Derive an expression for velocity of satellite and orbital time period.