

A-0595

Total Pages : 3

Roll No.

MSCPH-521

M.Sc. PHYSICS (MSCPH)

(Digital Electronics and Communication System)

3rd Semester Examination, Session December 2024

Time : 2:00 Hrs.

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 answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.***

Section-A

Long Answer Type Questions **2×19=38**

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.

1. Draw the circuit diagram of all logic gates and explain the action of each gate along with its truth table.
2. Minimize the following Boolean function using Tabulation method. Check with K-map reduction method :

$$f(A, B, C, D) = \Sigma(0, 1, 2, 3, 6, 7, 13, 14)$$

3. Briefly describe the following with reference to D/A converters :
 - (a) A multiplying-type D/A converter;
 - (b) A commanding-type D/A converter;
 - (c) The voltage switching mode of operation.
4. What is meant by the term modulation ? What is the principle types of modulation used in communication system ? What is the need for modulation in communication system ?
5. What are the elements of satellite communication ? Explain each of them with a suitable block diagram.

Section–B

Short Answer Type Questions 4×8=32

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.

1. Differentiate binary number system and Binary Coded Decimal.
2. Determine the Gray code equivalent of $(10011)_2$ and the binary equivalent of the Gray code number 110011.
3. What is X-OR gate ? Explain along with truth table.
4. Find $(185)_{10} - (8)_{10}$ using the excess-3 code.
5. Discuss Ring counter with its applications.
6. Explain loop antenna with neat sketch. Draw radiation pattern. State its advantages and applications.
7. Briefly explain the working of TV-receiver with the help of block diagram.
8. A satellite is orbiting in the equatorial plane with a period from perigee to perigee of 12 hours. Given that the eccentricity is 0.002, calculate the semi-major axis. The earth's equatorial radius is 6378.1414 Km.
