A–0438

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MSCPH-521

Master of Science Physics (MSCPH)

Digital Electronics and Communication System

Examination, June 2025

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. What do you understand by the term logic family ? What is the significance of the logic family with reference to digital integrated circuits (ICs) ?

2. What is the Gray code ? Why is it also known as the binary-reflected Gray code ? Briefly outline some of the important applications of the Gray code.

3. Explain the operation of RS and JK flip flops along with their truth tables.

4. Explain the functioning and working of Multiplexer and De multiplexer along with truth tables.

5. Write short notes on:

   (a) Dish antenna

   (b) SSB transmission.

   (c) Parabolic Reflector

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. Why are NAND and NOR gates called universal gates ? Justify your answer with the help of examples

2. With a neat circuit diagram explain the Ladder type D/A converter.

3. Write the excess-3 equivalent codes of $(6)_{10}$, $(78)_{10}$ and $(357)_{10}$, all in 16-bit format.

4. Discuss the generation of Frequency Modulation.

5. Explain the terms :

   (i) Gain

   (ii) Efficiency

   (iii) Radiation resistance of an antenna.

6. With the help of a schematic arrangement, explain how a J-K flip-flop can be used as a D flip-flop.

7. Write short notes on Radio receiver characteristics, Signal to noise ratio.

8. A satellite is orbiting round the earth at 4212km. The earth station is looking at this satellite at an elevation angle of 35°. Calculate slant range. Make suitable assumption.

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