A–0435

Total Pages : 3 **Roll No. .....**

MSCPH-509

Master of Science Physics (MSCPH)

Electronics

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. Describe the performance of an amplifier with respect to its input resistance, output resistance, effective collector load, current gain, voltage gain, and power gain.

2. Discuss the construction, working and characteristic curves of enhancement only MOSFET.

3. Explain the working of an Operational Amplifier (Op-Amp) with a block diagram. Discuss various configurations of Op-Amps and their applications.

4. What is virtual ground ? What are the advantages and disadvantages of active rectifiers versus passive rectifiers ?

5. Describe the process of Photolithography in Monolithic IC Technology. What is the difference between monolithic and hybrid ICs ?

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. Define pinch-off voltage of JFET ? Differentiate between pinch-off and cut off voltage in JFET.

2. What is the difference between Comparator and Schmitt Trigger ?

3. Explain common mode operation and common mode rejection ratio (CMRR). Why is it important ?

4. Explain the difference between positive and negative voltage level detectors (comparators).

5. Describe the construction and working of a tunnel diode. Draw and explain its V-I characteristics.

6. Discuss advantages and disadvantages of FET over BJT ?

7. What is the function of a clamper ? What are the differences between active and passive clampers ?

8. Calculate the maximum current handled by zener diode having a breakdown voltage of 6 volt with a maximum power dissipation of 364 mW ?

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