A–1181

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

MSCPH-509

M.Sc. Physics (MSCPH)

Electronics

Examination February, 2026

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 construction and working of a Zener diode. Draw its V-I characteristics and explain. Discuss Zener diode as a voltage regulator.

2. What is a transistor biasing ? What are the main reasons behind using the biasing circuits ? Discuss the voltage divider bias of transistor. Derive the expressions for stability factor and collector current.

3. Describe the following :

   (i) Characteristics of FET

   (ii) Applications of FET

   (iii) Parameters of FET

   (iv) Advantages and disadvantages of FET

4. What is operational amplifier ? Discuss ideal characteristics of an Op-amp and the implications of these characteristics on circuit analysis with neat diagram.

5. What is an integrated circuit ? Give their classification and discuss the making of monolithic IC.

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. Explain the principle of photodiode.
2. What is distortion ? Explain the concept of harmonic distortion.
3. Give the advantages and applications of MOSFET.
4. Give the comparison of N-channel with P-channel FETs.
5. Explain the concept of an ideal op-amp and list the assumptions made when analyzing it.
6. Explain the role of "virtual short" concept in analyzing inverting and non-inverting op-amp configuration. How does this concept simplify the derivation of gain formulae ?
7. What is an IC ? Give advantages of ICs.
8. What are charge couple devices ? Explain.

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