A-0592

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

MSCPH–509

M.Sc. PHYSICS (MSCPH)

(Electronics)

2nd 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. Discuss construction, working and V-l characteristics of Zener diode ? Define voltage regulation. How zener diode used as a voltage regulator in power supply system.

2. Explain the input and output characteristics of a NPN transistor and discuss its working as an amplifier.

3. Discuss the construction and working of a field effect transistors ? Why they are named so ? Also discuss the drain characteristic of JFET and effect of pinch off voltage on its depletion region.

4. Describe the characteristics of an ideal Op-Amp and compare it with a practical Op-Amp IC741.

5. Explain the classification of Integrated Circuits (ICs) and discuss their construction techniques.

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. What do you understand by Charged Coupled Devices (CCD).

2. What is the switching behavior of a transistor ? How is it applied in digital circuits ?

3. Define input resistance and output resistance in an amplifier. Why are these important ?

4. What are the different biasing schemes used in transistors ? Why is proper biasing necessary ?

5. What is feedback in an amplifier ? Explain the difference between positive and negative feedback.

6. What do you understand by zero crossing dectector. Explain it.

7. What is the difference between single-ended and double-ended inputs in Op-Amps ?

8. Draw and label the pinout of IC741 and describe the function of any two pins.

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