

# C163

Total Pages : 3

Roll No. ....

## MSCPH-509

### Electronics

M.Sc. Physics (MSCPH)

2nd Semester Examination, 2022 (June)

**Time : 2 Hours]**

**Max. Marks : 80**

**Note :** This paper is of Eighty (80) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein.

### SECTION-A

#### (Long Answer Type Questions)

**Note :** Section 'A' contains Five (05) long answer type questions of Twenty (20) marks each. Learners are required to answer any Two (02) questions only.

(2×20=40)

1. Discuss the construction, working and V-I characteristics of P-N junction diode? How does an actual diode differ from an ideal diode? Also discuss the effect of temperature on reverse saturation current of P-N junction diode.

2. Discuss the construction and working of a field effect transistor? Why they are named so? Also discuss the drain characteristic of JFET and effect of pinch off voltage on its depletion region.
3. What is an Operational amplifier? State assumptions made for analyzing an ideal Op-Amp and also explain CMRR, slew rate and transfer characteristics of an Op-Amp.
4. What are the transistors? Explain the structure and working of NPN transistor. Also explain the input and output characteristics of NPN transistor in Common emitter configuration.
5. Explain in detail the applications of Op-Amp as amplifiers such as inverting, non-inverting and differential amplifier.

## **SECTION-B**

### **(Short Answer Type Questions)**

**Note :** Section 'B' contains Eight (08) short answer type questions of Ten (10) marks each. Learners are required to answer any Four (04) questions only. (4×10=40)

1. Discuss construction, working and V-I characteristics of Zener diode. Define voltage regulation. How Zener diode used as a voltage regulator in power supply system ?
2. Discuss advantages and disadvantages of FET over BJT in detail.

3. Determine the voltage, current and power gain of an Amplifier that has an input signal of 10 mV and a corresponding output signal at 10 V. Also express all the three gains in decibel (dB).
  4. What is an analog computer and what is it used for? Also explain the advantages and disadvantages of the analog computer versus the digital computer.
  5. What is the difference between monolithic and hybrid ICs? Explain advantages and disadvantages of ICs and also describe the process used in monolithic technology.
  6. Discuss the construction, working and characteristic curves of enhancement type MOSFET.
  7. Explain the construction and working principle of a Solar cell. Write down the advantages and disadvantages of a Solar cell.
  8. What are the rectifiers? Explain the advantages and disadvantages of active rectifiers versus passive rectifiers?
-

