

**NATIONAL INSTITUTE OF TECHNOLOGY KURUKSHETRA**  
**ELECTRONIC DEVICES AND CIRCUITS (ECPC 201)**

Class Test-1<sup>st</sup> (2024-2025)

Time: 50 min.

MM. 20

**NOTE: Attempt any four questions. Assume suitable data, if required.**

✓ Q. 1 Discuss the working of a PN junction diode with the help of energy band diagrams. Draw the equivalent circuit model (Piecewise-linear model) of diode and compare it with ideal diode model. [5]

✓ Q. 2 Determine  $V_o$  and  $I_D$  for the networks of Fig. 1 (a) and (b). For a Ge diode the offset voltage is 0.3 V and for a GaAs diode it is 1.2 V. [5]

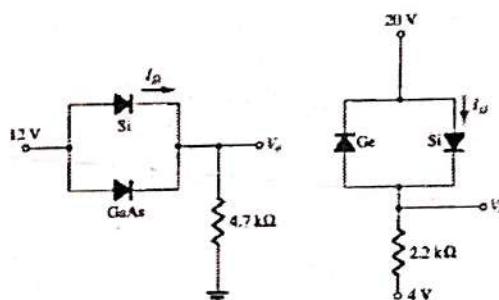


Fig. 1

(a)

(b)

✓ Q. 3 Sketch the output voltage shown in Fig. 2 (Consider Silicon diodes) OR in Fig. 3. [5]

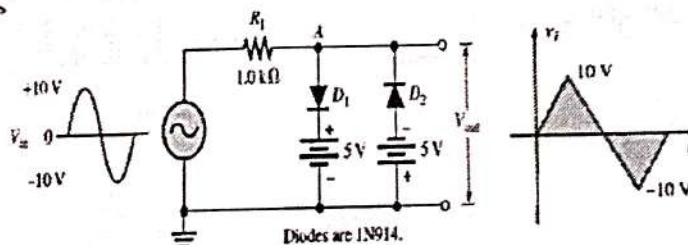


Fig. 2

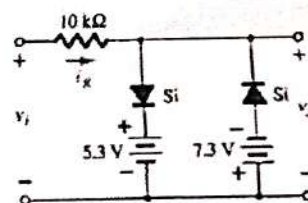


Fig. 3

✓ Q. 4. Consider Germanium diode and sketch the output voltage shown in Fig. 4. [5]

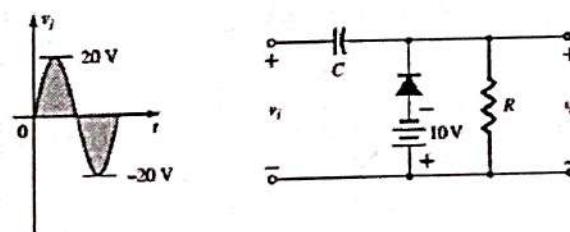


Fig. 4

✓ Q. 5 Design a voltage regulator that will maintain an output voltage of 10 V across a 1 KΩ load with an input that will vary between 30 V and 50 V. That is, determine the proper value of  $R_s$  (voltage source series resistance) and the maximum current  $I_{ZM}$ . [5]

2kΩ  
10mA