NATIONAL INSTITUTE OF TECHNOLOGY KURUKSHETRA
ELECTRONIC DEVICES AND CIRCUITS (ECPC 201)
Class Test-1st (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]

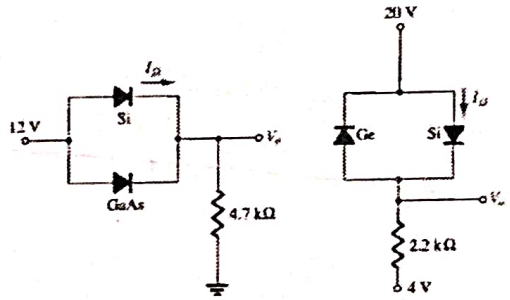


Fig. 1

(a) (b)

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

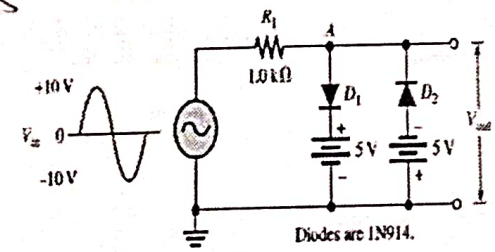
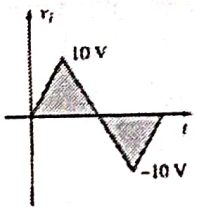


Fig. 2



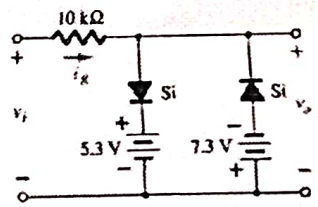


Fig. 3

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

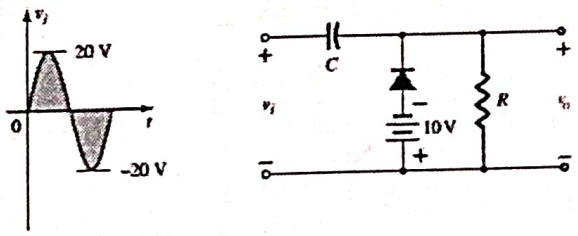


Fig. 4

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]