EAST WEST UNIVERSITY
Department of Computer Science and Engineering
B.Sc. in Computer Science and Engineering Program
Mid Term I Examination, Fall-2021

Course: **CSE 251 – Electronic Circuits, Section-5**
Instructor: **Surajit Das Barman, Senior Lecturer, CSE Department**
Full Marks: **20**
Time: **1 Hour and 25 Minutes**
Note: There are SIX questions, answer ALL of them. Course outcomes (CO), cognitive levels and marks of each question are mentioned at the right margin.

1. **Determine** the value of resistor for a voltage regulator circuit in Fig. 1, where each of diode D1 and D2 has a voltage drop of 0.7 V at a current of 10 mA. The analysis should include the operating conditions of the diodes.   [CO1, C2, Mark: 3]
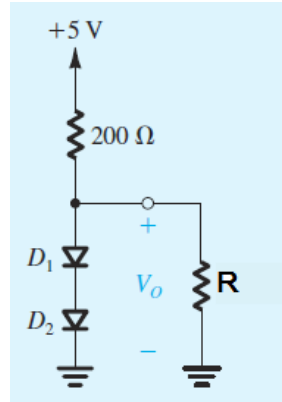

Fig. 1

2. For the input voltage $v_i = 100 \sin \omega t$ and the network in Fig. 2, **sketch** the output voltage v_0 and also **calculate** the average value of the output voltage.   [CO2, C3, EP1, Mark: 3]
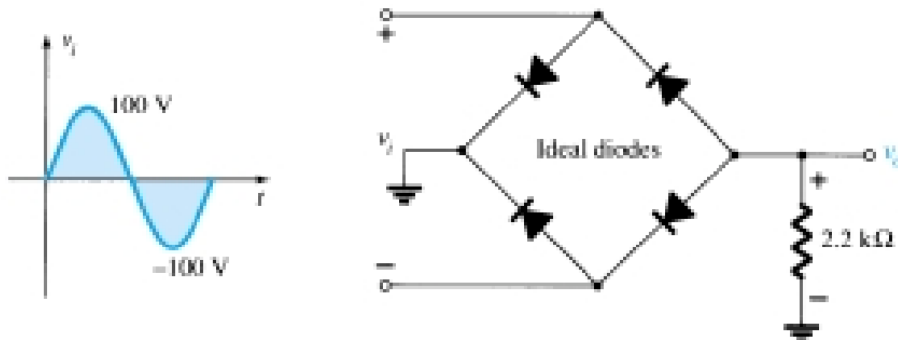

Fig. 2

3. **Sketch** the waveform of output v_o for the network in Fig. 3. Assume, the input voltage v_i is a pure triangular signal having peak-to-peak 24 V and the diodes are silicon diodes.   [CO2, C4, EP1, Mark: 5]
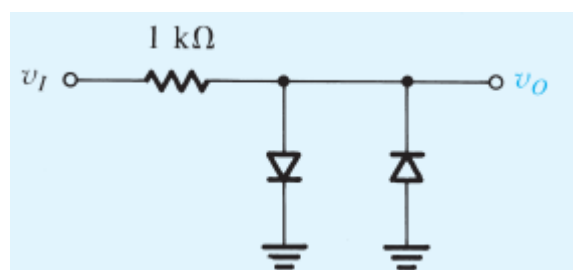

Fig. 3

4. Assuming that the diodes in the circuits of Fig. 4 are ideal, **find** the values of the labeled voltages and currents.
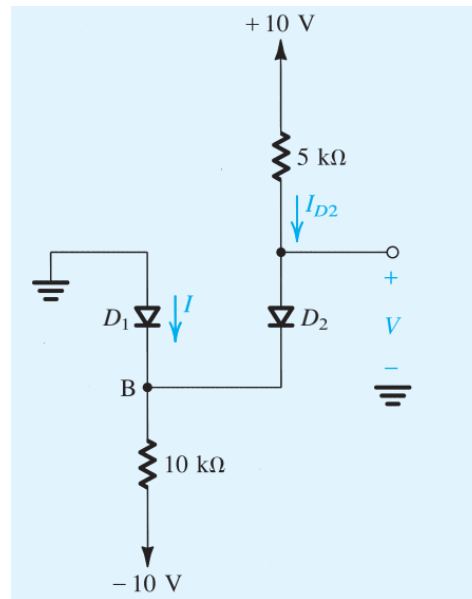
[CO1, C3, EP1, Mark: 3]

Fig. 4

5. Let $i_C = 2mA, v_{BE} = 0.7V$ and $\alpha = 0.8$ for a *npn* transistor. **Determine** the value of I_S, i_B, i_E and β.

[CO1, C2, Mark: 2]

6. **Design** the circuit in Fig. 5 to establish a current of $0.5\ mA$ in the emitter and a voltage of $-0.5\ V$ at the collector. The transistor $v_{EB} = 0.64\ V$ at $I_E = 0.1\ mA$ and $\beta = 100$.
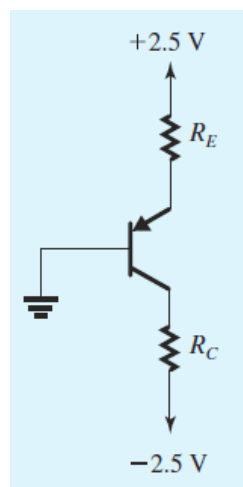
[CO2, C4, EP1, Mark: 4]

Fig. 5