## VIT
Vellore Institute of Technology

School of Electronics Engineering

Continuous Assessment Test – II | ECE1002 – Semiconductor Devices and Circuits
Class Number: VL2018195001226, 1229, 1232, 1234, 1236, 1240, 1248
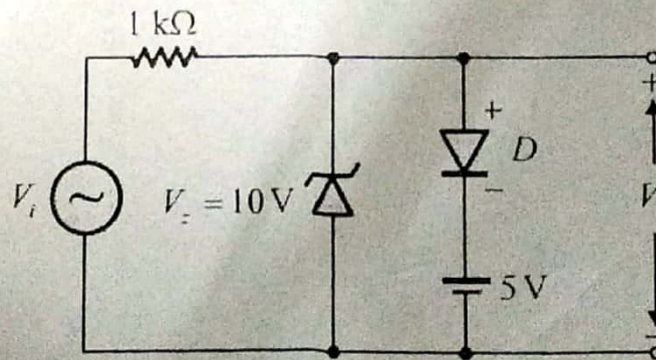
Slot: C2+TC2

Maximum Marks: 50 Marks

1. (a). Determine the values of current (I) and voltage (V) for the circuit shown in Fig. 1. [10]
    Assume the diodes are ideal
    (b). Repeat (a) considering the diodes are silicon.

Fig. 1
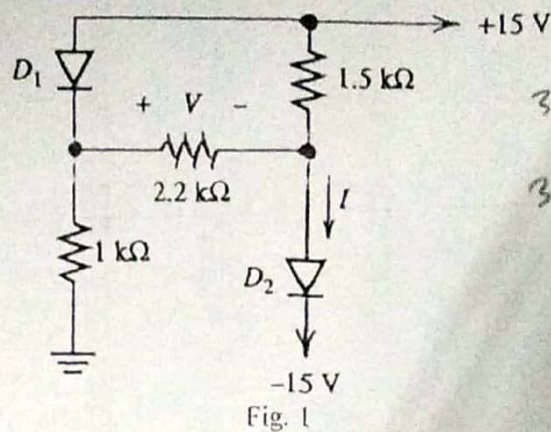
2. Sketch the transfer characteristic curve for the circuit shown in Fig.2 Assume the forward [15]
    voltage drop of both the diodes are 0.7 V.

Fig. 2

3. A 220 V, 60 Hz voltage is applied to a centre tapped transformer with turns ratio of 22: 1 [5]
    with a load of 1 kΩ. If the resistance of half-secondary winding is 0.5 Ω, Determine:

    (a) peak, rms and dc voltages,
    (b) peak, rms and dc currents,

(c) dc power delivered to the load 5mW W

(d) ripple factor 1.9%

(e) What is the PIV of each diode? $0 \text{ } e$ $10V$
Assume diodes to be ideal.

4. The circuit shown in Fig. 4 is operating at point Q_2 in the active region. Find the values of [10] V_{CC} and V_{BB} to move the Q point from Q_2 to Q_1 ($V_{CE} = 2.3$ V and $I_C = 3.7$ mA).
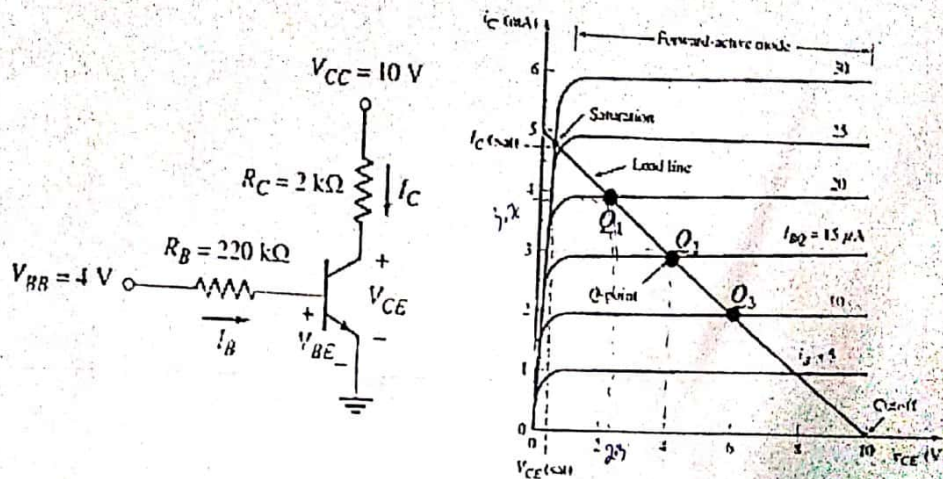
$9.7 \quad 5.1$

Fig. 4

5. Construct the voltage divider bias network in Fig. 5 to establish a current $I_E = 5$ mA using a [10] power supply $V_{CC} = 12$ V. $\beta = 50$.
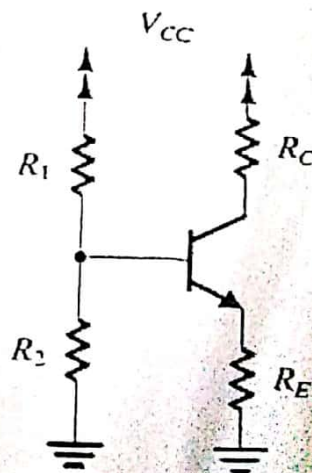

Fig. 5