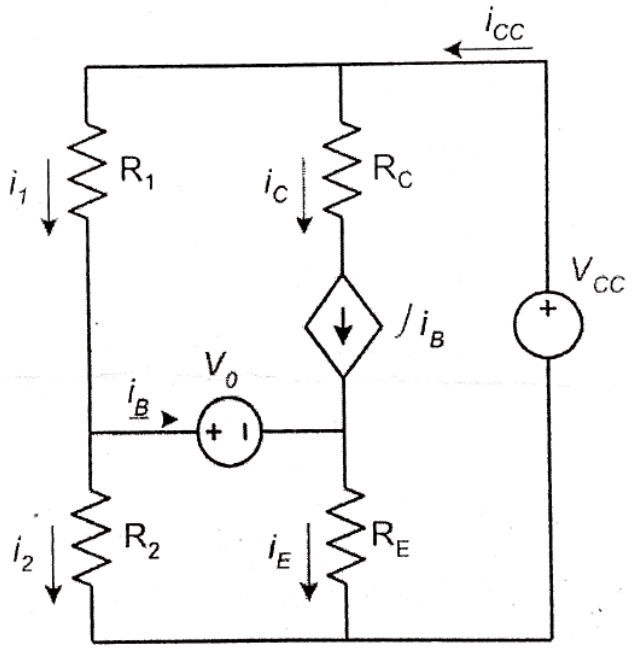
Bangladesh University

Department of CSE
Mid Term Examination, Fall Semester 2025
Course Code: CSE-1303
Course Title: *Electronic Device & Circuit*
Batch: 69th (Evening)
Course Teacher: Faria Afrin Niha

Time: 1.5 hours | Total Marks: 20

Answer any four questions below.

1. (a) What is a dependent source in an electrical circuit? For the circuit shown, where V_{CC} = **12V, V_0 =0.7V, R_1=10 kΩ, R_2= 5 kΩ, R_E= 1kΩ, J=50**, calculate the value of the base current i_B. (5)



2. (a) What is meant by an Electrical Device and Circuit (EDC)? Explain the main types of electrical devices and circuits, providing suitable examples for each type. (3)

   (b) Write a short note about- (2)

   (i) Capacitors

   (ii) Inductors

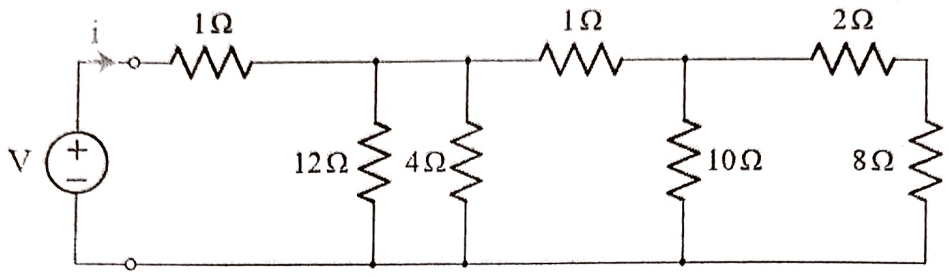
   (iii) Transistors

3. (a) Explain the difference between a series circuit and a parallel circuit. (2)

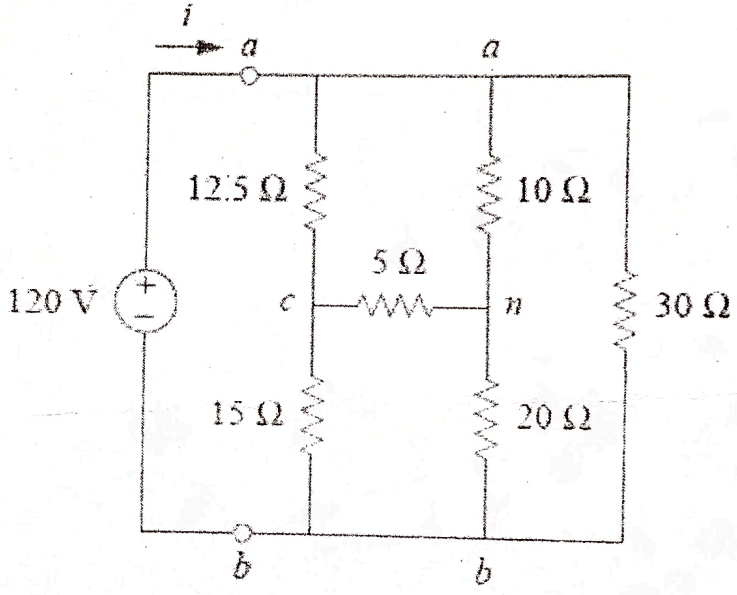
   (b) Consider the circuit shown in the figure above. The circuit consists of a combination of series and parallel resistors connected to a voltage source V. (3)

   (i) Determine the equivalent resistance R_{eq} of the entire circuit.

   (ii) If the voltage source V=24V, calculate the total current i supplied by the source.



4. (a) Obtain the equivalent resistance R_{ab} for the circuit in Fig. and use it to find current I using Delta to Wye Conversion. (3)



(b) Explain the purpose of Wye-to-Delta (Y-Δ) and Delta-to-Wye (Δ-Y) conversions in three-phase circuits. Give one example of when each conversion would be used. (2)

5. (a) Define amplitude and peak-to-peak value of a waveform. A sinusoidal voltage signal varies from +12 V to −12 V. (2)

(i) Determine the amplitude of the signal.

(ii) Determine the peak-to-peak value of the signal.

(b) The voltages across two components are: (1.5)

$$V_A = 20\sin(\omega t - 25^\circ),\ V_B = 15\sin(\omega t + 35^\circ)$$

Determine the leading voltage and the angle by which it leads.

(c) Define Phasors. Why does a phasor represent a sinusoidal AC voltage or current rotate in the anti-clockwise direction in the complex plane? (1.5)