**B.Sc. in CSE, 2nd Semester** **Date: 20 February 2023 (Afternoon)**

# ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)

ORGANISATION OF ISLAMIC COOPERATION (OIC)

**DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING**

**Mid-Semester Examination** **Summer Semester: 2021 - 2022**
**Course No.: PHY 4241** **Full Marks: 75**
**Course Title: Physics II** **Time: 90 Minutes**

There are **03 (three)** questions. Answer **03 (three)** questions. The symbols have their usual meanings. Marks of each question and corresponding CO and PO are written in the brackets.

---

**1.** i. Find I in the circuit in Fig. 1(a). **8 (CO2) (PO1, PO2)**

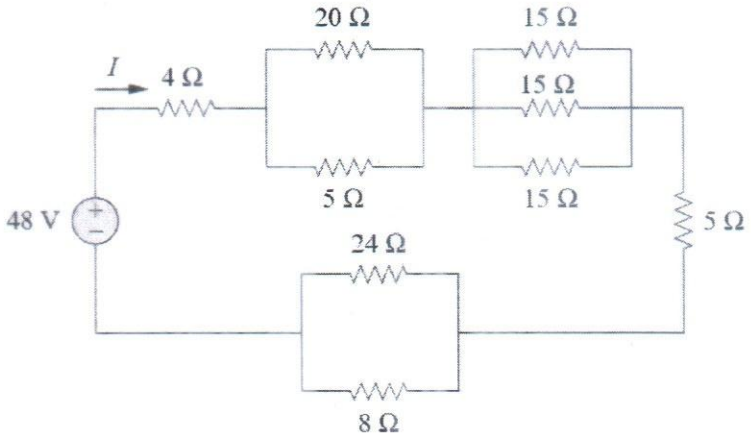


Fig. 1(a)

ii. Find $R_{eq}$ *and* $i_0$ for the circuit in Fig. 1(b). **8 (CO2) (PO1, PO2)**

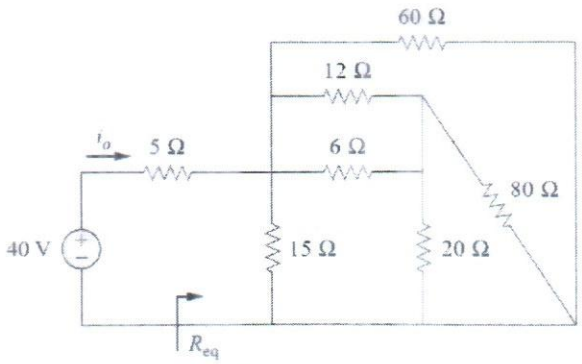


Fig. 1(b)

iii. For the circuit in Fig. 1(c), find $i_1$ *through* $i_4$. **9 (CO2) (PO1, PO2)**

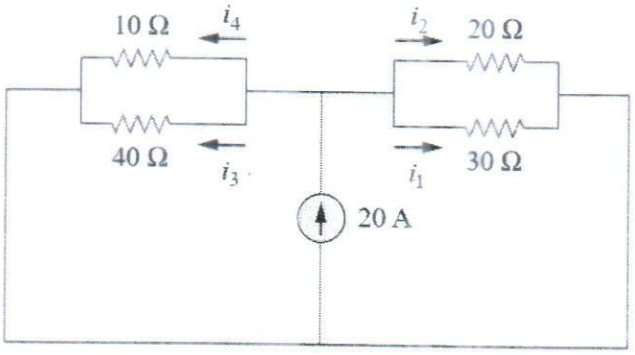


Fig. 1(c)

**2.** i. Find node voltages for the circuit in Fig. 2(a) using Nodal analysis. **12 (CO2) (PO1, PO2)**

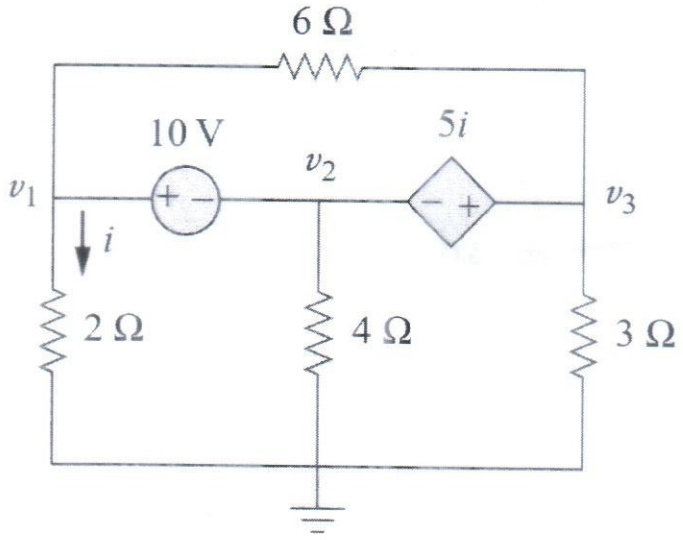


Fig. 2(a)

ii. Determine $i_0$ for the circuit in Fig. 2(b) using Mesh analysis. **13 (CO2) (PO1, PO2)**

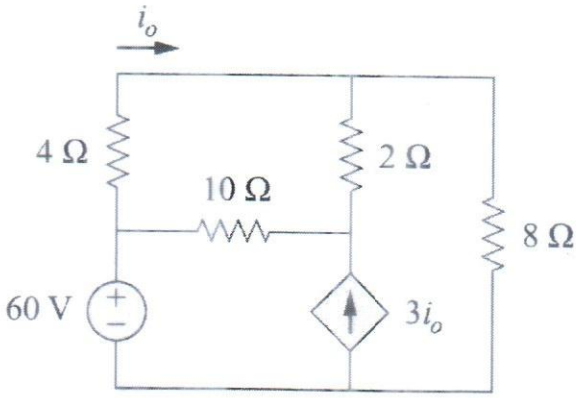


Fig. 2(b)

**3.** i. Find $v_x$ for the circuit in Fig. 3(a) using source transformation. Show all the steps. **8 (CO2) (PO1, PO2)**

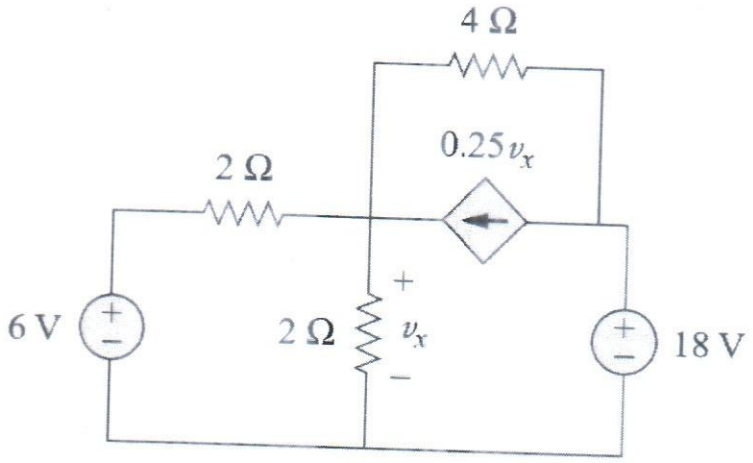


Fig. 3(a)

ii. Determine the value of the load resistor for which maximum power will be delivered in the circuit in Fig. 3(b). Also find the maximum power. **8 (CO2) (PO1, PO2)**

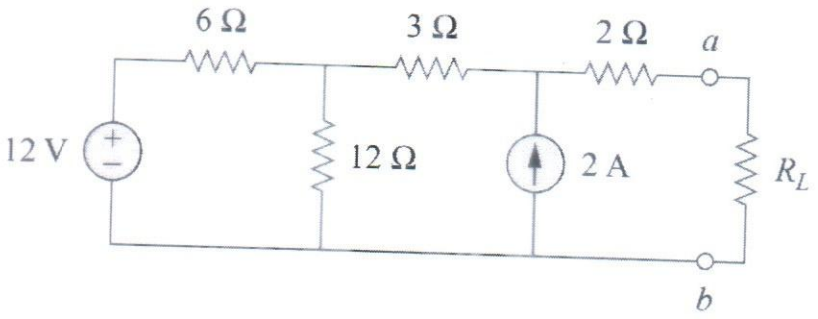


Fig. 3(b)

iii. Find the Thevenin equivalent circuit of the circuit in Fig. 3(c). **9 (CO2) (PO1, PO2)**

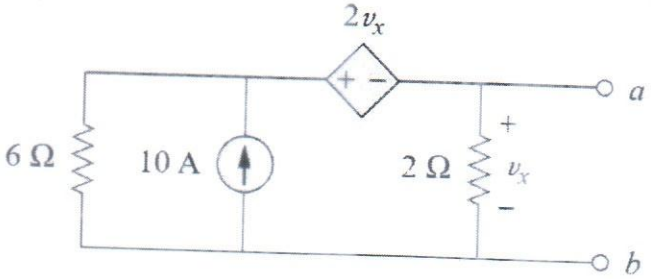


Fig. 3(c)