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B.Sc. Engg.(CSE), 2nd Sem. Date: August 13, 2018 (Morning)

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Mid-Semester Examination
Course No.: Phy 4241
Course Title: Physics II

Summer Semester, A. Y. 2017-2018
Time: 90 Minutes
Full Marks: 75

There are **4 (four)** questions. Answer **any 3 (three)** questions. All questions carry equal marks. Marks in the margin indicate full marks. Programmable calculators are not allowed. Do not write on this question paper. All symbols bear their usual meanings.

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1. a) For the circuit shown in Fig. 1(a), find V_0 / V_s in terms of α, R_1, R_2, R_3, and R_4. If $R_1 = R_2 = R_3 = R_4$, what value of α will produce $|V_0 / V_s| = 15$? 08

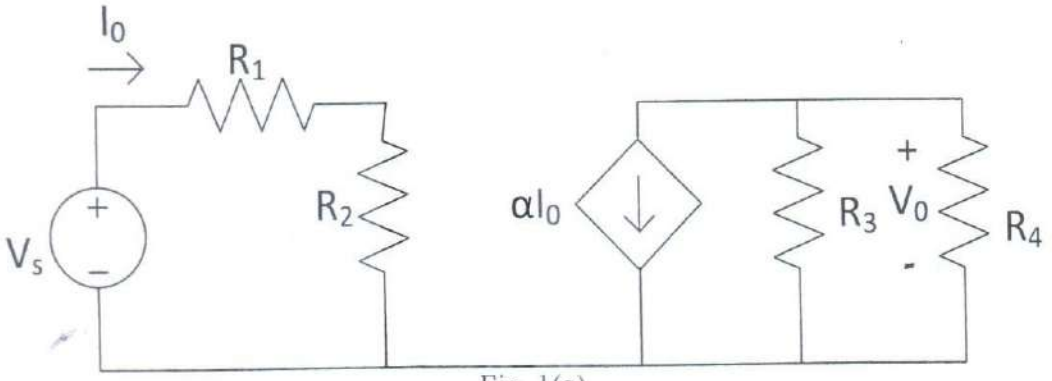

Fig. 1(a)

b) Obtain the equivalent resistance, R_{ab} in the circuit of Fig. 1(b). All the resistors have a value of 40 Ω. 13

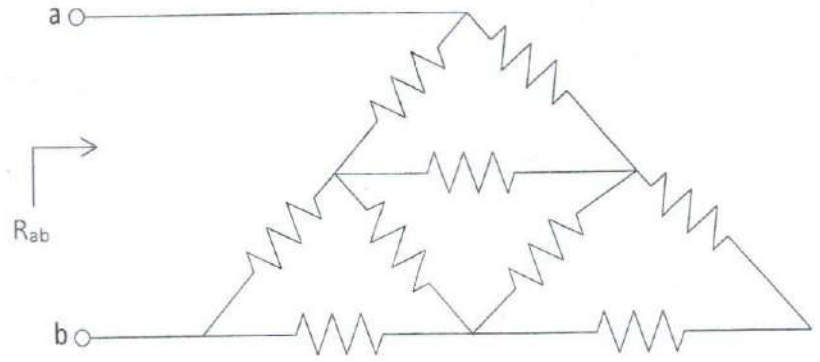

Fig. 1(b)

c) Define supermesh and supernode. 04

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2. a) Find the node voltages of the circuit shown in Fig. 2(a). 15

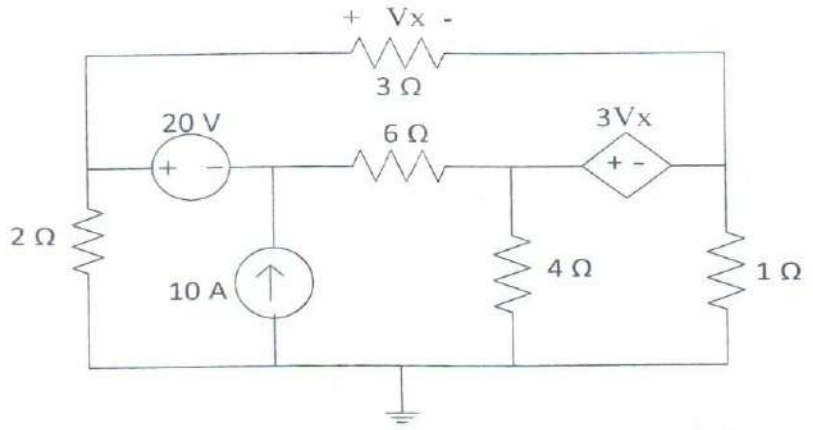

Fig. 2(a)

b) Write one use of Δ-Y transformation. Find the current delivered by the source in the circuit shown in Fig. 2(b). 10

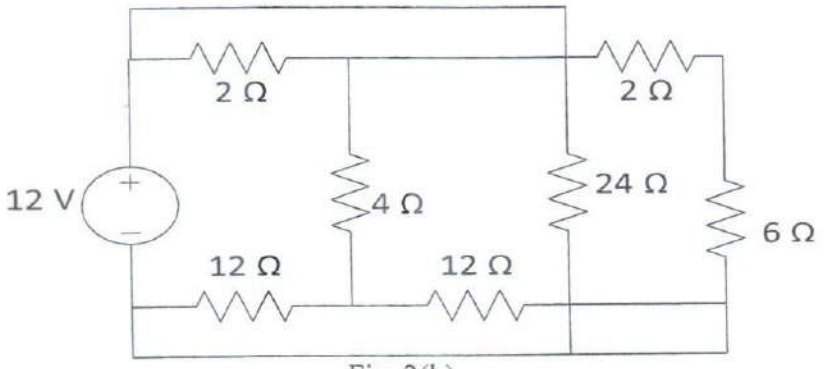

Fig. 2(b)

3. a) Use both resistance and source combinations, as well as, current division, in the circuit of Fig. 3(a) to find the power absorbed by the 1 Ω resistor. 15

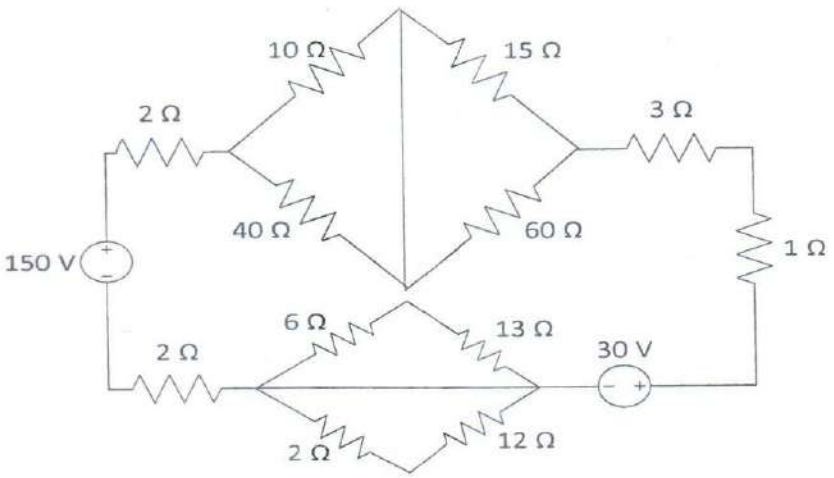

Fig. 3(a)

b) Find the values of R_1 and R_2 in the circuit of Fig. 3(b) if the voltmeter and ammeter read 6 V and 0.6 A, respectively. 10

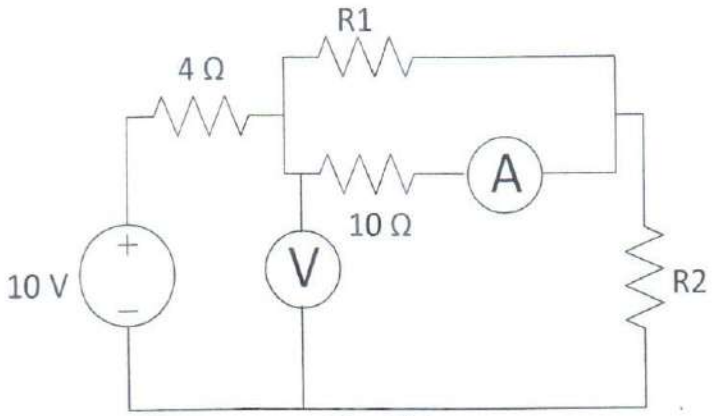

Fig. 3(b)

4. a) In the circuit shown in Fig. 4(a), find the terminal voltage, V_{ab} using superposition theorem. 12

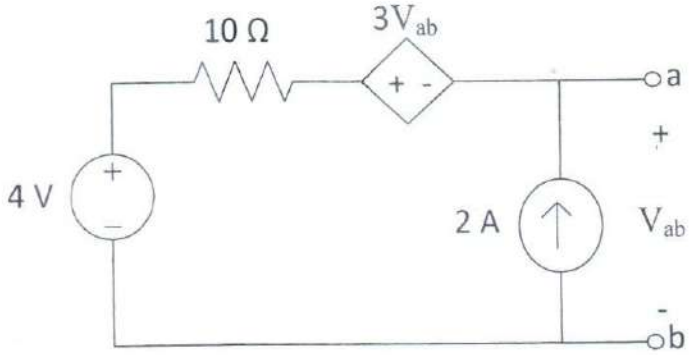

Fig. 4(a)

b) The variable resistor in the circuit shown in Fig. 4(b) is adjusted for maximum power transfer to R_L. Find the value of R_L. Also find the maximum power that can be delivered to R_L. 13

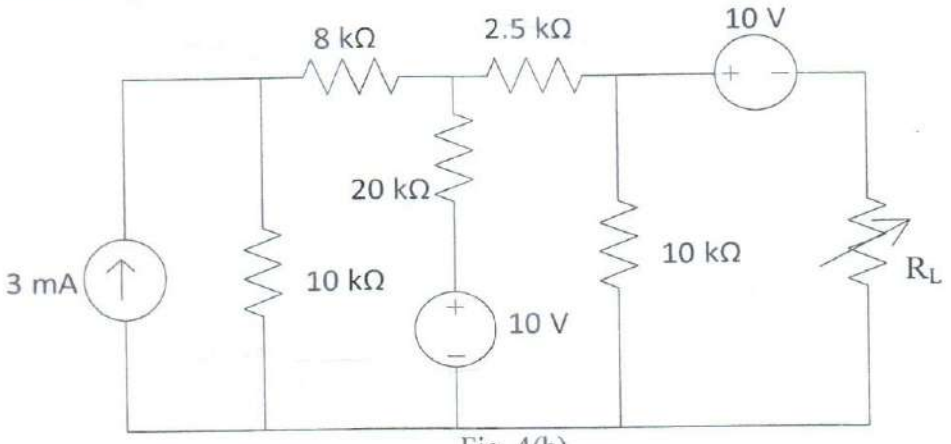

Fig. 4(b)