

(An Autonomous Institute of Govt. of Maharashtra)

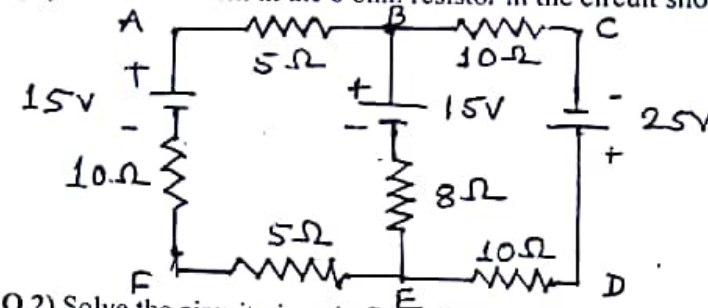
45 min

{Time= 1 hour} Subject: Basic Electrical Engineering {Marks= 08}

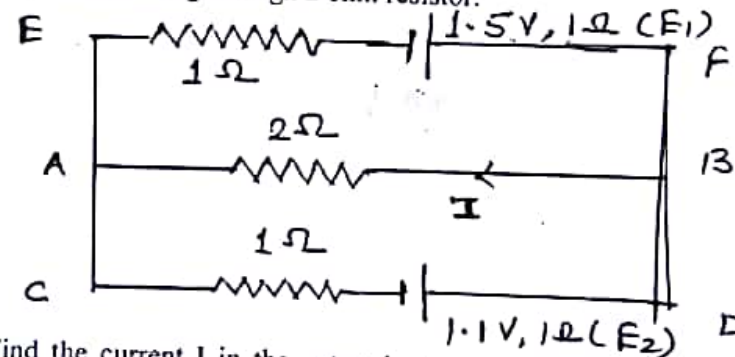
Note: 1) Attempt any TWO of the following

2) All questions carry equal marks (Each 4 Marks)

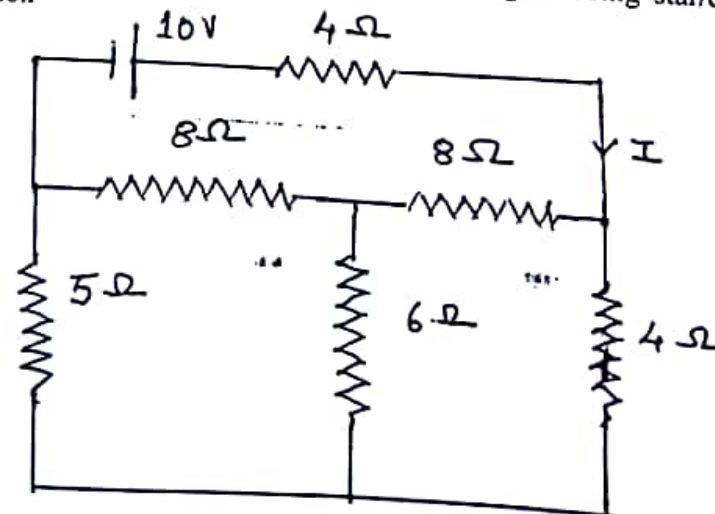
Q.1) Find the current in the 8 ohm resistor in the circuit shown in figure.



Q.2) Solve the circuit given in figure by applying superposition theorem to find the current flowing through 2 ohm resistor.



Q.3) Find the current I in the network shown in figure using star/delta transformation



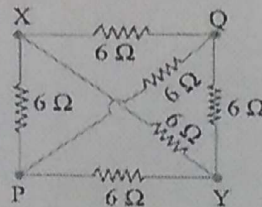
$$R_{eq} = R_a + R_b + \frac{R_a R_b}{R_c}$$

{Time= 1 hour} Subject: Basic Electrical Engineering {Marks= 08}

Note: Q.1 Compulsory (2 marks)

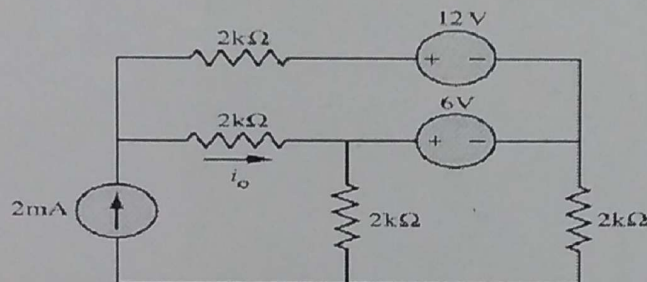
From Q.2 Attempt any TWO (Each 3 Marks)

Q.1 If all resistance are of $6\ \Omega$, calculate the equivalent resistance between any two diagonal points



Q.2) Attempt any TWO (Each 3 marks)

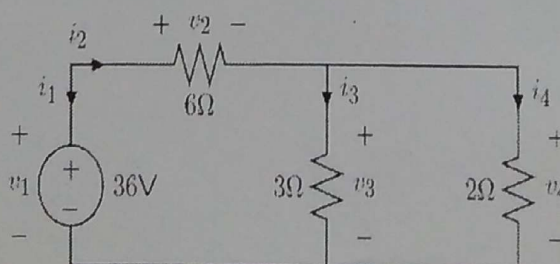
a) Use superposition principle to find i_0 in the circuit shown in Fig.



b) An electric iron is marked 250V, 500W. What current does it take if connected to the correct voltage? What is hot resistance? If the iron is used for one hour daily for 30 days in a month, what will be the monthly bill at Rs. 4.50 per unit? How does the cost get affected if the voltage is only 200V instead of 250V?

c) Solve the following circuit by Kirchhoff's law and find value of

$i_1, i_2, i_3, i_4, v_2, v_3, v_4$



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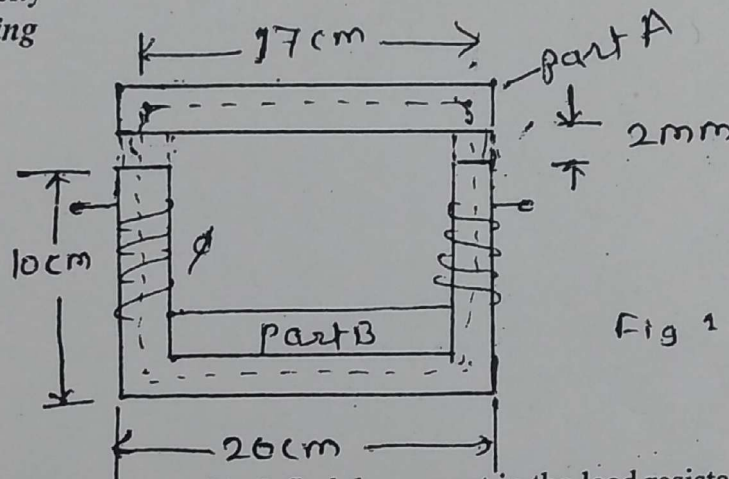
{Time= 1 hour} Subject: Basic Electrical Engineering {Marks= 08}

Note: ALL questions are compulsory

Q.1. The magnetic circuit frame shown in figure is built up of iron of square cross section, 3 cm side. Each air gap is 2mm wide. Each of coils is wound with 1000 turns and exciting current is 1.0 Amp. The relative permeability of part A and part B may be taken as 1000 and 1200 respectively. Calculate the following

- | | |
|--|-------|
| i) Reluctance of part A | 1/2M |
| (ii) Reluctance of part B | 1/2 M |
| (iii) Reluctance of two air gaps | 1/2M |
| (iv) Total reluctance of the complete magnetic circuit | 1/2 M |
| (v) The MMF | 1/2M |
| (vi) Total flux | 1/2M |
| (vii) Flux density | 1/2M |

Circuit Drawing



Q.2. For the circuit shown in Fig.2 find the current in the load resistance $R_L = 18 \Omega$ and the voltage across it by Norton's theorem and verify the result by applying Thevenin's Theorem

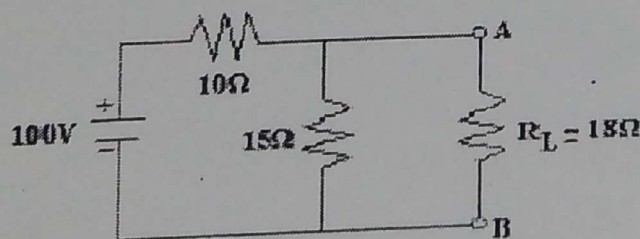


Fig.1

(4)

Norton Theorem 2 M

Verification by Thevenin 2 M

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{Time: 1 hour} Subject: Basic Electrical Engineering {Marks: 08}

Q.1. Determine current flowing through 5Ω resistor in the circuit shown in Fig.1.

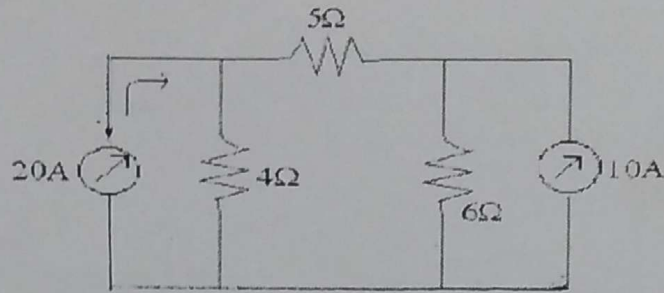


Fig.1

--- (3)

Q.2. In a factory the following appliances are in operation as given below:

- a. 1.492 kW motor 3 hours daily.
- b. 100 W lamp 12 hours daily.
- c. 1000 W lamp 2 hour daily.

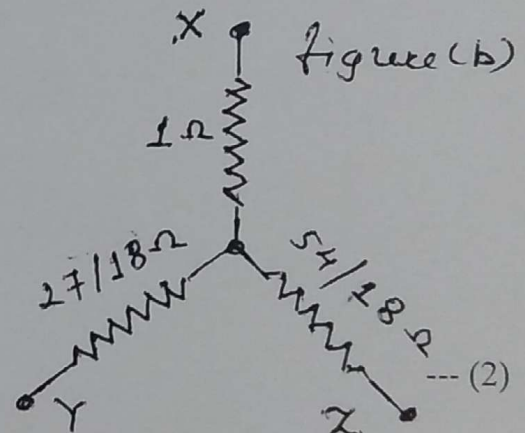
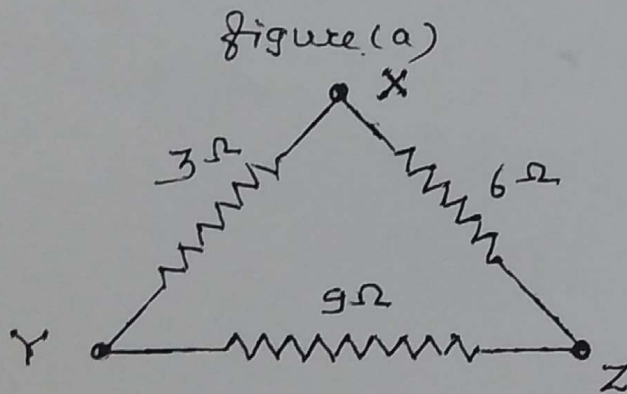
Calculate the cost for energy consumed for a month consisting of 30 days.

1 unit cost = Rs. 4.00

--- (2)

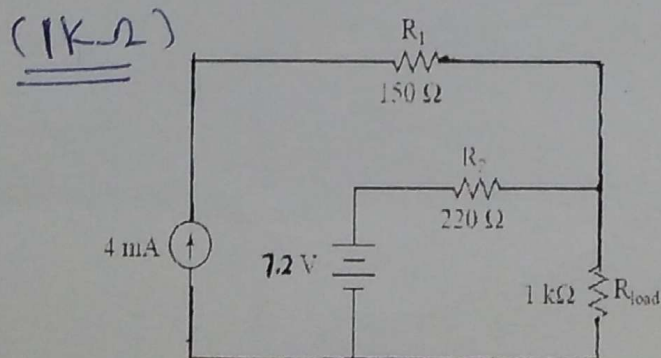
OR

Q.2. Show that resistances in figure a and figure b are equivalent without using star-delta transformation



--- (2)

Q.3. Apply the Superposition Theorem to calculate the current through the load resistance (1Ω) in following circuit.



--- (3)

GOVERNMENT COLLEGE OF ENGINEERING, AMRAVATI

DEPARTMENT OF ELECTRICAL ENGINEERING

CLASS TEST - I

COURSE: BASIC ELECTRICAL ENGINEERING (EEU 201)

SEMESTER: II

MAX MARKS: 08

DURATION: 1.00 Hr.

NOTE: Attempt any TWO out of first THREE and Last Question is compulsory.

Q.No.1. Determine the value of unknown resistance R and the total current drawn from the source in the circuit of Fig. 1. Also compute the total power dissipated in the circuit. All resistances are in ohm. [03 Marks]

Q.No.2. Find the voltage across 3Ω resistor of Fig. 2 using Thevenin's Theorem. [03 Marks]

Q.No.3. Define Temperature Co-efficient of resistance and derive the expression for resistance temperature co-efficient at $t_2^\circ\text{C}$, if α_1 be the resistance temperature co-efficient of a conductor at $t_1^\circ\text{C}$. [03 Marks]

Q.No.4. a) How do you distinguish between conductance and conductivity of a conductor? What are their units? [01 Mark]
b) State the Superposition Theorem. [01 Mark]

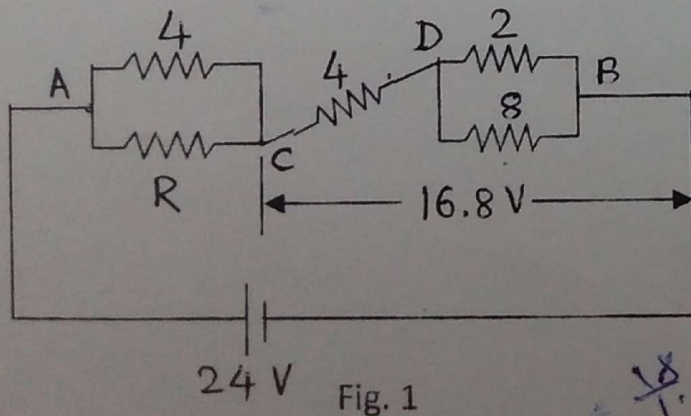


Fig. 1

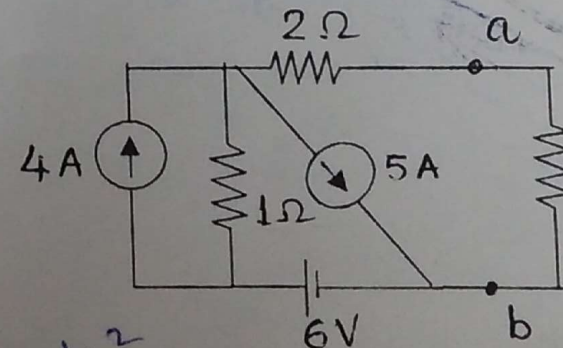


Fig. 2

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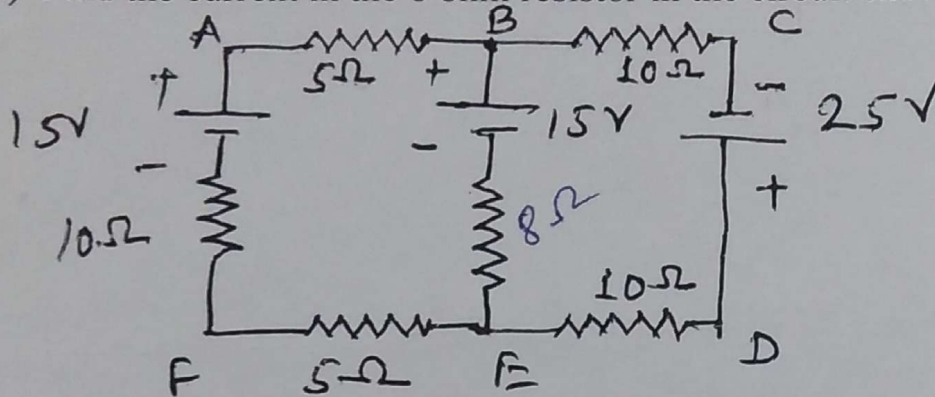
45 min

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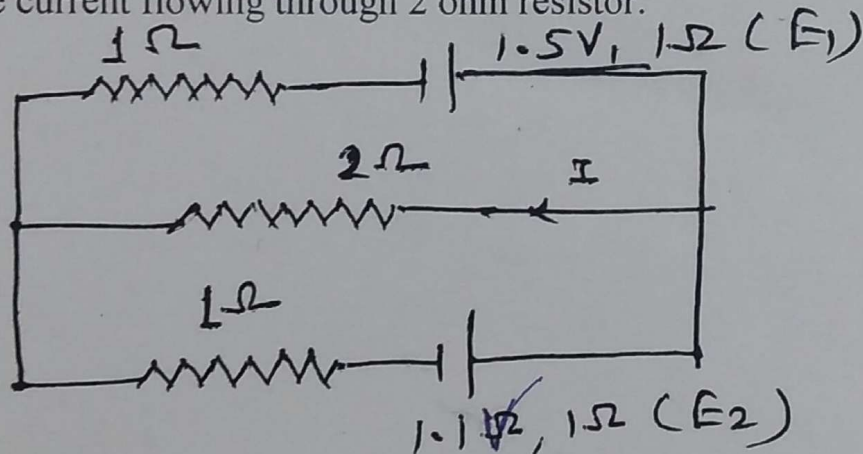
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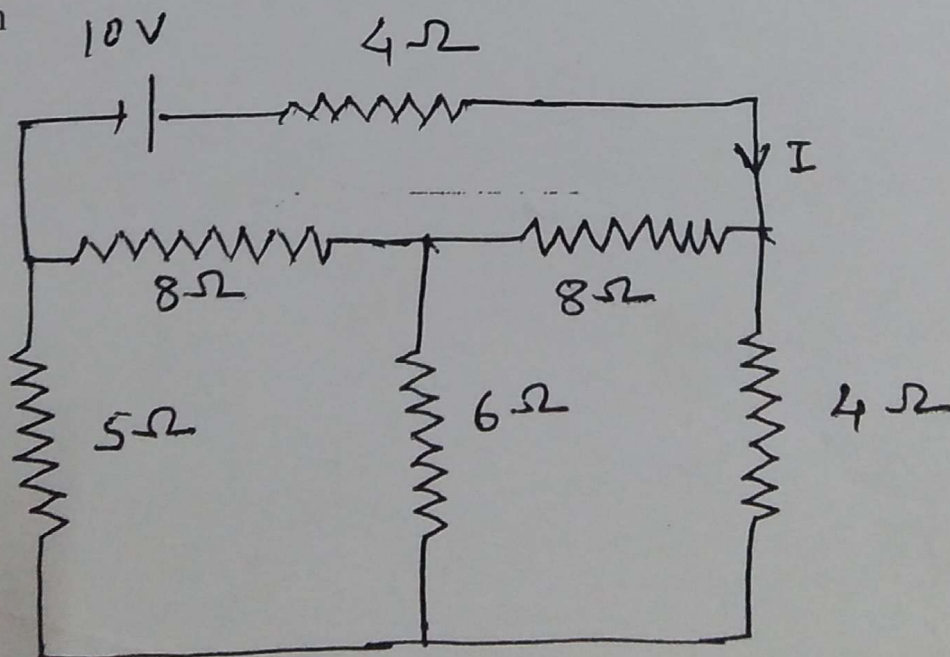
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{Time= 1 hour} Subject: Basic Electrical Engineering {Marks= 08}

Note: From Q.1 Attempt any TWO

Q.2 is compulsory

Q.1 i) Superposition theorem can be applicable only to circuits having _____ elements.

- (A) Non- linear (B) Passive
(C) Resistive (D) Linear bilateral (1)

ii) Thevenin's equivalent circuit consists of _____.

- (A) Series combination of R_{Th} , E_{Th} and R_L .
(B) Series combination of R_{Th} , E_{Th} .
(C) Parallel combination of R_{Th} , E_{Th} .
(D) Parallel combination of R_{Th} , E_{Th} and R_L . (1)

iii) Watt hour is the unit of

- (A) Electric power. (B) Electric capacity.
(C) Electric energy. (D) Electric charge. (1)

iv) Which of the following will remain the same in all parts of a series circuit?

- (A) Voltage (B) Current
(C) Power (D) Resistance (1)

Q.2) A Wheatstone bridge consists of $AB = 4\Omega$, $BC = 3\Omega$, $CD = 6\Omega$ and $DA = 5\Omega$. A 2 volt cell is connected between B and D and a galvanometer of 10Ω between A and C. Find the current through the galvanometer.

(6)

