

[This question paper contains 4 printed pages.]

Sr. No. of Question Paper : 6847

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Your Roll No.....

Unique Paper Code : 222171

Name of the Course : B.Sc. Physical Science

Name of the Paper : Electronics – I Network Analysis (ELPT-101)

Semester : I

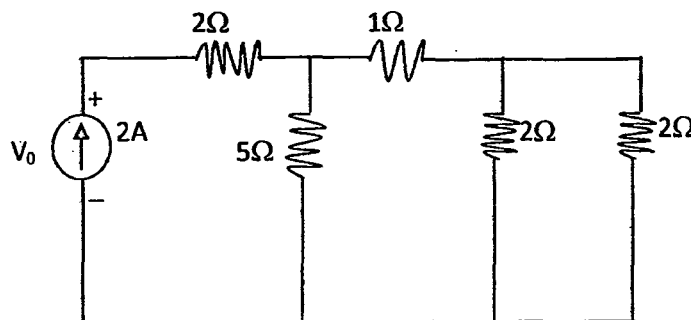
Time : 3 Hours

Maximum Marks : 75

Instructions for Candidates

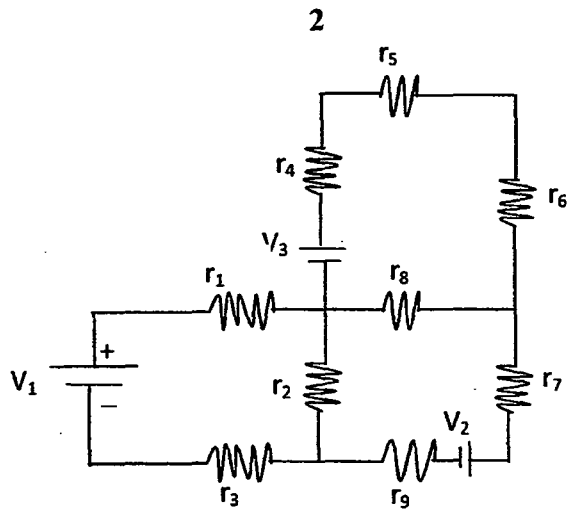
1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any FIVE questions.
3. All questions carry equal marks.

1. (a) State and explain Kirchoffs current law in detail. (8)
(b) Find v_0 in the given circuit. (7)

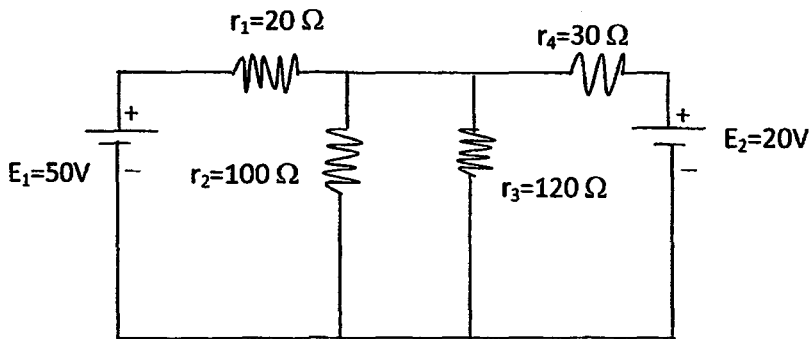


2. (a) In the given circuit determine the
(i) Number of circuit elements, (ii) nodes and (iii) junction points (3)

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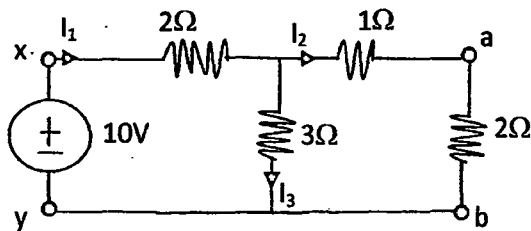
(b) Using nodal method find the current through r_2 in the circuit below



(5)

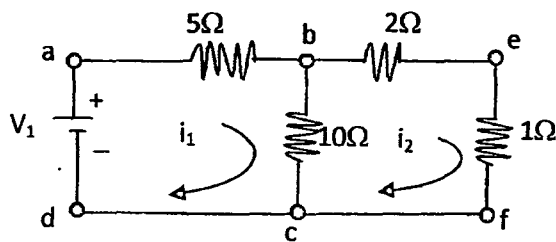
(c) State reciprocity theorem. Show the application of reciprocity theorem in the network in Fig. below

(7)

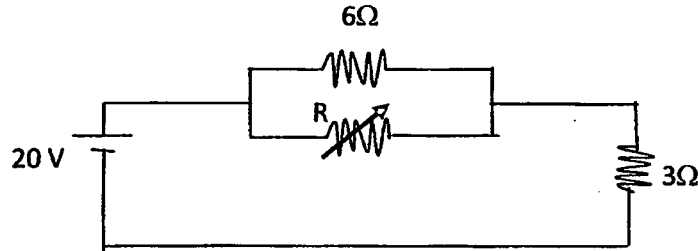


3. (a) In the circuit given below find the (V_2/V_1) using mesh method.

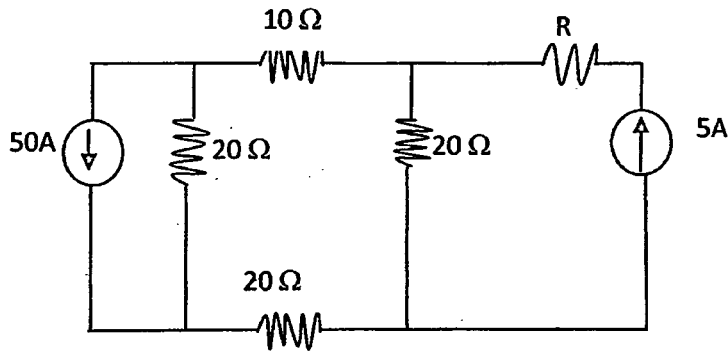
(5)



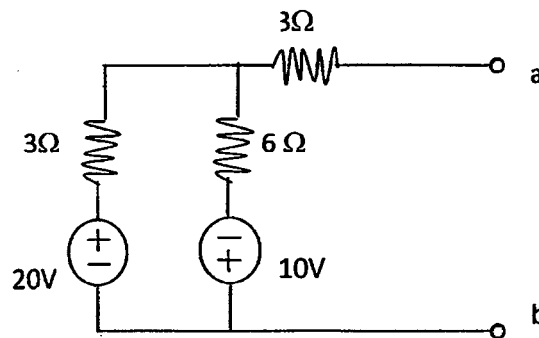
- (b) State and prove maximum power theorem. (6)
- (c) What is the value of resistor R for maximum power dissipation in 3Ω resistor : (4)



4. (a) Explain the parallel RLC circuits in detail. Also explain the overdamped and underdamped cases. (10)
- (b) Obtain the value of current in 10Ω resistor using superposition theorem. Does the value of resistor R effect the current through 10Ω resistor. (5)



5. (a) Obtain the Thevenin and the Nortons equivalent for the active network in the figure below (8)



- (b) What are phasors ? (2)
- (c) A series circuit with $R = 10\Omega$ and $L = 20 \text{ mH}$ has current $i = 2.0 \sin 500t$ amperes. Obtain total voltage v and the angle by which i lags v . (5)
6. (a) Explain in detail the sinusoidal response of RL circuit. (7)
- (b) An impedance of $Z\Omega$ draws a current of $(-2 + j10)\text{A}$ from a 50 Hz $(100 + j50)$ supply. What is the value of impedance, power factor and real power consumed ? (8)
7. (a) Define resonance. Find the resonance frequency of series RLC circuit and give the properties of resonance for the same circuit. (10)
- (b) For the series RLC Circuit in fig. below find the resonant frequency. Also find the half power frequencies and bandwidth. (5)

