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Roll No. ....

**TEE-101**

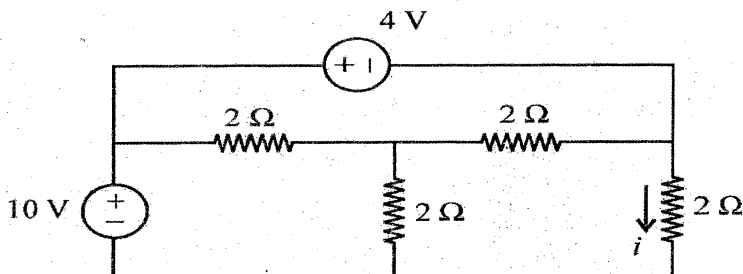
**B. TECH. (FIRST SEMESTER)  
END SEMESTER  
EXAMINATION, Dec., 2023  
BASIC ELECTRICAL ENGINEERING**

**Time : Three Hours**

**Maximum Marks : 100**

- Note :** (i) All questions are compulsory.  
(ii) Answer any *two* sub-questions among (a), (b) and (c) in each main question.  
(iii) Total marks in each main question are **twenty**.  
(iv) Each sub-question carries 10 marks.

1. (a) Find current  $i$  in the circuit using Mesh Analysis : (CO1)

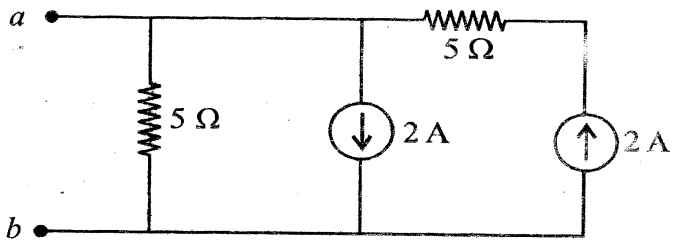


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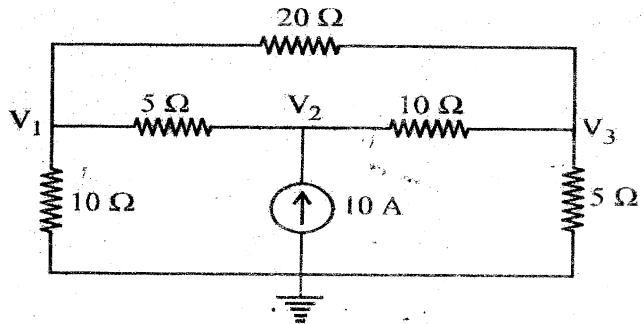
(2)

TEE-101

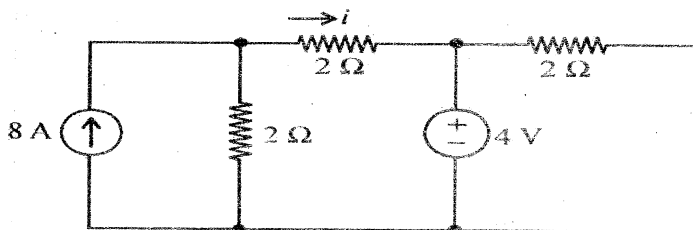
- (b) For the network shown in fig., find the Norton equivalent current source and equivalent parallel resistance across terminal  $a$  and  $b$  : (CO1)



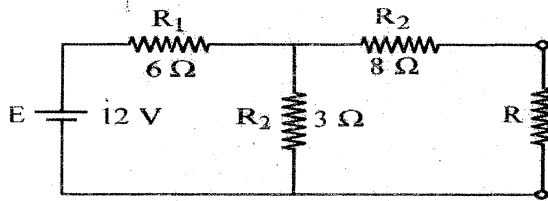
- (c) For the network shown in fig., find the node voltages using nodal analysis : (CO1)



2. (a) Apply Superposition principle to the circuit and find the current  $i$  due to the  $4\text{ V}$  source acting along is : (CO2)



- (b) For the network, determine the value of  $R$  for maximum power to  $R$ , and calculate the maximum power delivered : (CO1)



- (c) Derive the r. m. s. and d. c. voltage for full wave sinusoidal waveform. Also calculate form factor and peak factor. (CO1)
3. (a) In a particular R-L series circuit a voltage of 10 V at 50 Hz produces a current of 700 mA while the same voltage at 75 Hz produces 500 mA. Find the values of  $R$  and  $L$  in the circuit. (CO3)
- (b) A series RLC circuit having a resistance of  $50\ \Omega$ , an inductance of 500 mH and a capacitance of  $400\ \mu\text{F}$ , is energized from a 50 Hz, 230 V, AC supply. Find : (CO3)
- (i) resonant frequency of the circuit

- (ii) peak current drawn by the circuit at 50 Hz
- (iii) peak current drawn by the circuit at resonant frequency
- (c) Explain real power, reactive power and apparent power in detail along with power triangle. (CO3)
- 4. (a) Describe earthing and its importance in detail. (CO4)
- (b) Explain the working of MCB with suitable diagram. (CO4)
- (c) Explain the following terms : (CO4)
  - (i) Staircase wiring
  - (ii) Double pole double throw switch
- 5. (a) Explain working of DC motor along with its e. m. f. equation. (CO5)
- (b) Explain construction and working of Lead Acid Cell with suitable diagram in detail. (CO5)
- (c) An 8-pole lap-connected armature has 40 slots with 12 conductors per slot generates a voltage of 500 V. Determine the speed at which it is running if the flux per pole is 50 mWb. (CO5)