



C14-AEI-402

4414

BOARD DIPLOMA EXAMINATION, (C-14)

MARCH/APRIL—2017

DAEIE—FOURTH SEMESTER EXAMINATION

NETWORK THEORY

Time : 3 hours ]

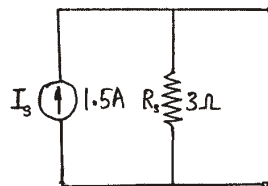
[ Total Marks : 80

**PART—A**

3×10=30

- Instructions** : (1) Answer **all** questions.  
(2) Each question carries **three** marks.  
(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. State Kirchhoff's law.
2. Three resistances of 6 ohms each are connected in delta. Find the equivalent star.
3. Define the terms (a) junction, (b) branch and (c) loop.
4. Define node, mesh and principal node.
5. Define tree, co-tree and links.
6. State the maximum power transfer theorem.
7. Convert the current source to voltage source in the followings :



8. Write the expressions for impedance and current at resonance in series  $R$ - $L$ - $C$  circuit.

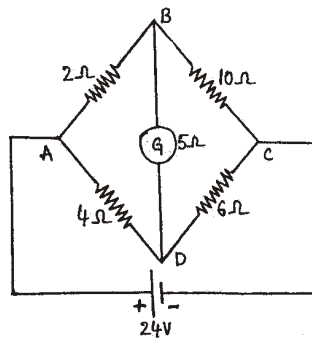
- \* 9. Give the formula for power and power factor in  $R$ - $C$  series circuit.
10. The currents flowing through a  $0.1$  H coil is given by  $i = 10 \sin 314 t$ . Find the sinusoidal expression for the voltage across the coil.

**PART—B**

10×5=50

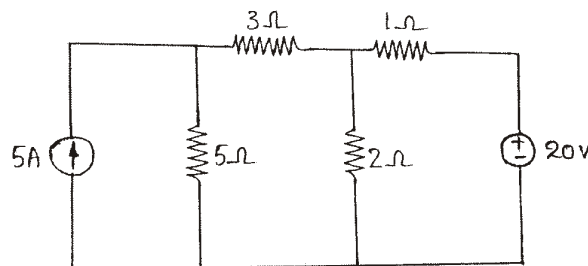
- Instructions :** (1) Answer *any five* questions.  
 (2) Each question carries **ten** marks.  
 (3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. Find the galvanometer current in the Wheatstone bridge as shown in the figure below :

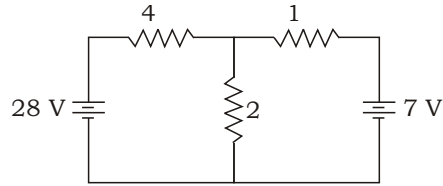


12. Derive the transformation formula for delta to star transformation.

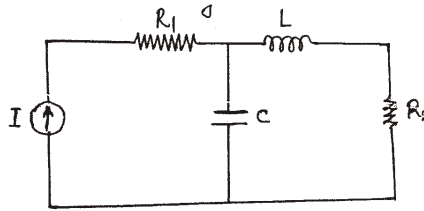
13. Write the node voltage equations and determine the currents in each branch for the network shown in the figure below :



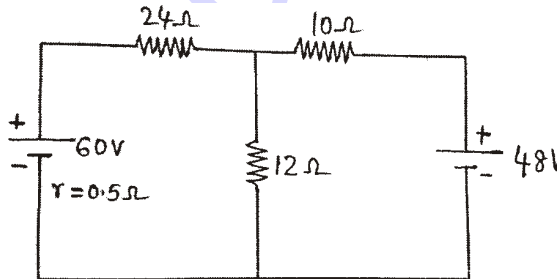
- \* **14.** (a) Find the current through 2 resistor using superposition theorem :



- (b) Draw the dual network for the given network shown below :



- 15.** State and explain Norton's theorem.
- 16.** Determine the current in each branch of the network as shown below by using superposition theorem :



- 17.** Show that in a pure inductive circuit, power consumed is zero using equations of voltage and current.
- 18.** A resistance of 12 ohms, and inductance of 0.15 H and capacitance of 100 F are connected in series across a 100 volt, 50 Hz supply. Calculate (a) impedance, (b) current, (c) power factor and (d) power.

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