* 4436 *

C14–EC–403

4436

BOARD DIPLOMA EXAMINATION, (C–14)

MARCH/APRIL—2018

DECE—FOURTH SEMESTER EXAMINATION

NETWORK ANALYSIS

Time : 3 hours] [*Total Marks* : 80

PART—A 3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

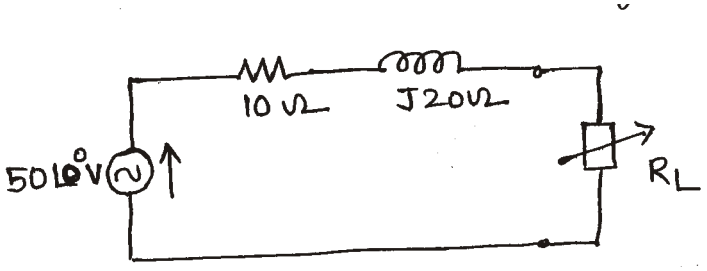
(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Write the differences between active elements and passive elements.

2. Explain DOT rule for coupled circuits.

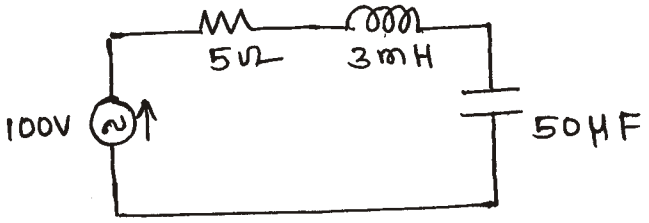
3. State reciprocity theorem.

4. Determine the value of R_L for which the source delivers maximum power to the load R_L in the circuit diagram given below :



5. Define the terms Tree, Co-Tree and Links.

6. Draw the dual network for the given series network :



7. Define the terms 'steady-state' and 'transient'.

8. Write the conditions for symmetry and reciprocity in terms of *Z*, *Y*, *h*, *ABCD* parametes.

9. Define the terms characteristic impedance and propagation constant.

10. Design a simple T-type high-pass filter having cutoff frequency of 1 kHz to operate with a terminated load resistance of 600 .

PART—B

10×5=50

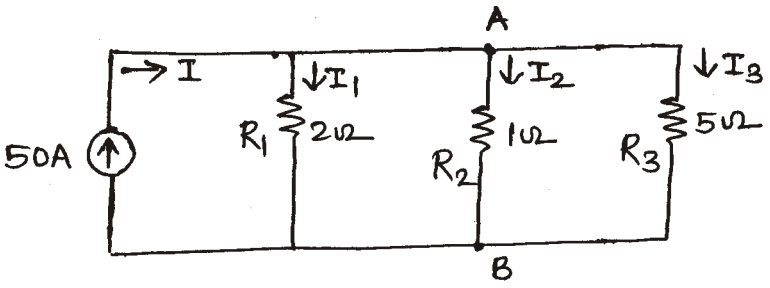
Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

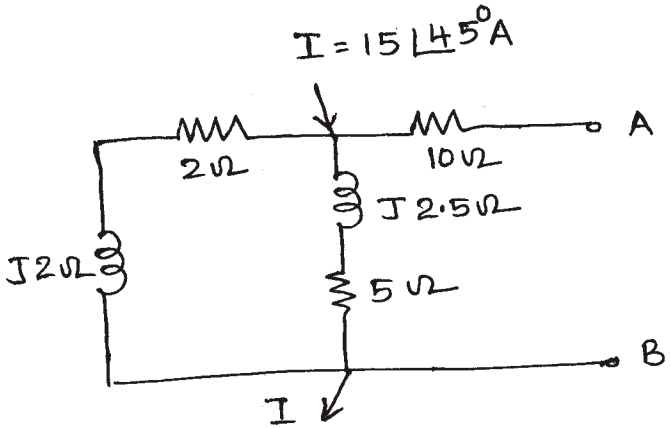
(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. *(a)* Explain ideal voltage source and ideal current source. 4

(b) Determine the currents in all resistors in the circuit shown below, using KCL : 6

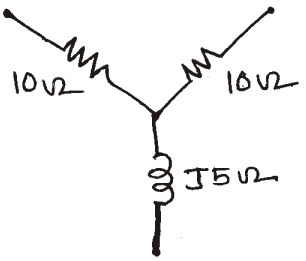


12. *(a)* Draw the Thevenin's equivalent network at terminals *AB* of the given network : 7

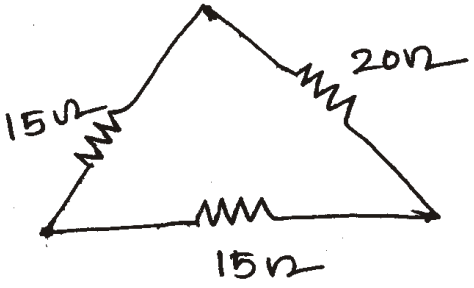


(b) List the advantages of Norton's theorem. 3

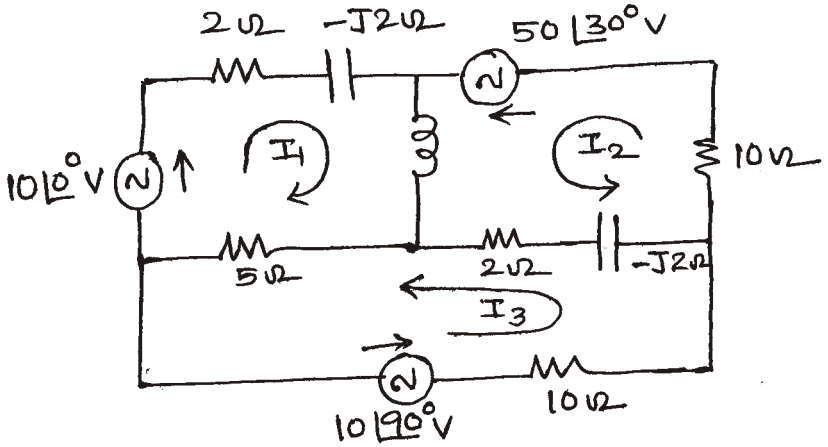
13. *(a)* Convert the given star-network in to an equivalent delta-network : 5



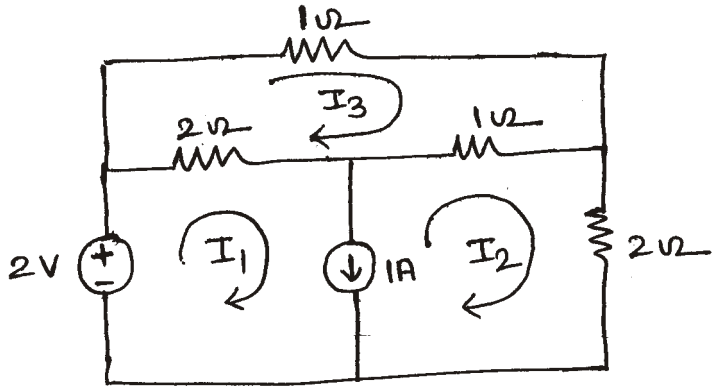
(b) Convert the given delta-network in to an equivalent star-network : 5



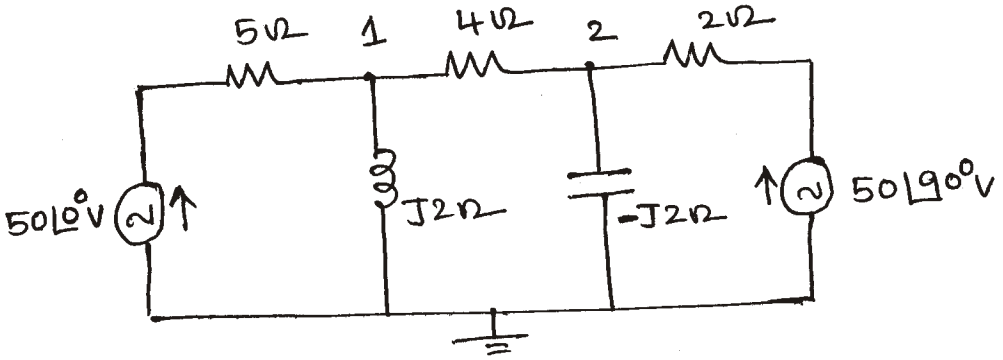
14. *(a)* Write the mesh current equations for the given network and arrange them in matrix form : 5



(b) Apply super mesh techniques to find mesh currents I_1, I_2 and I_3 for the given network : 5



15. Determine node voltages V_1 and V_2, using Crammer's rule of the given network : 10

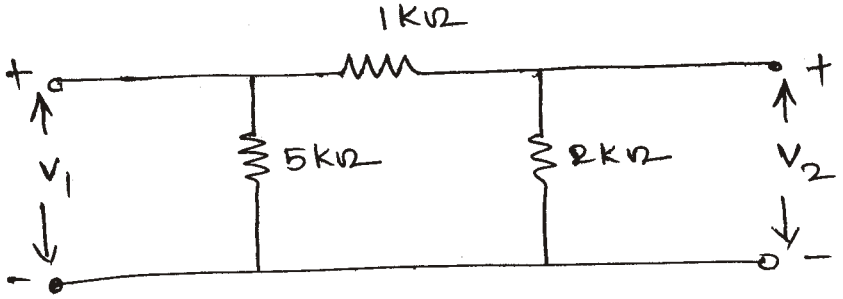


16. *(a)* A series *R-C* circuit with R 5000 and C 20 f has a constant voltage V 100 volts applied at t 0 by closing a switch and capacitor has no initial charge, find the complete current. 5

(b) Explain how *R-C* circuit acts as an integrator. 5

17. *(a)* Explain the short circuit admittance (Y) parameters with equivalent circuit. 5

(b) Find the *Y*-parameters for the network shown below : 5



18. *(a)* Draw the characteristics curves of LPF, HPF, BPF and BSF filters. 4

(b) Design a T-type attenuator to give 60 db attenuation and to have a line impedance of 500 . 6

★ ★ ★