

**6236**  
**BOARD DIPLOMA EXAMINATION**  
**JUNE - 2019**  
**DIPLOMA IN ELECTRONICS AND COMMUNICATION ENGINEERING**  
**NETWORK ANALYSIS**  
**THIRD SEMESTER EXAMINATION**

Time: 3 Hours

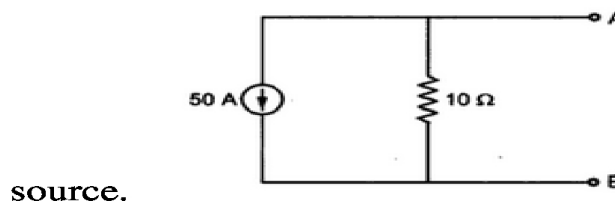
Total Marks: 80

**PART - A**      **(3m x 10 = 30m)**

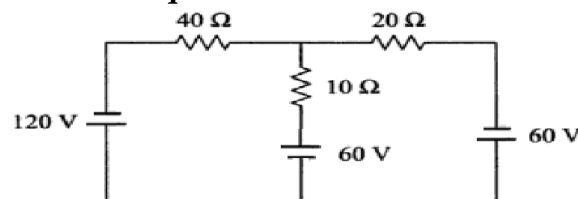
Note 1: Answer all questions and each question carries 3 marks

2: Answers should be brief and straight to the point and shall not exceed 5 simple sentences

1. Convert the following current source into the equivalent voltage



2. What are the limitations of Ohm's law?
3. Name the dual of the following:
- a) Voltage source      b) Open circuit      c) Node
4. Write mesh current equations for the network shown below.



5. What are the advantages of Norton's theorem?
- \* 6. What are the limitations of Reciprocity theorem?
7. Find Laplace Transform of  $[u(t-a) \cos(t-a)]$  using Second shifting property.
8. Write the Inverse Laplace Transforms of the given functions

$$i) \frac{s+a}{(s+a)^2 + \omega^2} \quad ii) \frac{s+a}{(s+a)^2 - b^2} \quad iii) \frac{1}{(s+a)^2}$$

9. Write the expressions for attenuation in Decibels in terms of Voltage, Current and Power

10. Draw Constant – K Low Pass T and  $\pi$  type Filters.

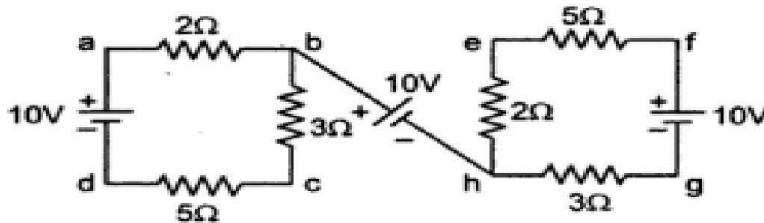
**PART - B** (10m x 5 = 50m)

Note 1: Answer any five questions and each carries 10 marks

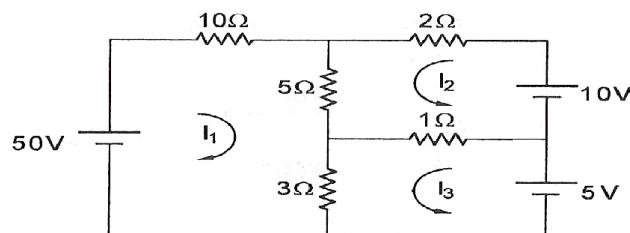
2: The answers should be comprehensive and the criteria for valuation is the content but not the length of the answer

11. For the following circuit, determine the voltages

i)  $V_{df}$  and ii)  $V_{ag}$

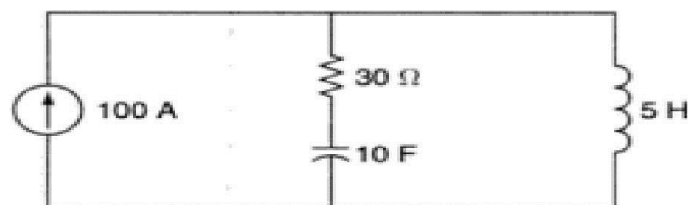


12. Determine the power absorbed by  $5\Omega$  resistor in the circuit shown below by using mesh analysis.

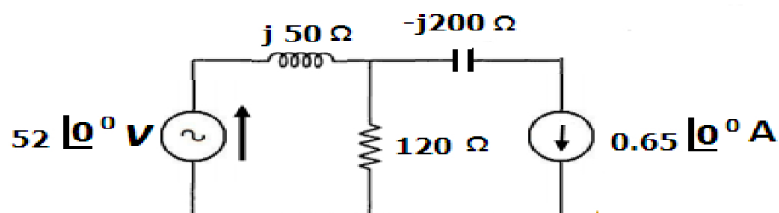


13. a) Explain duality of a network. (5)

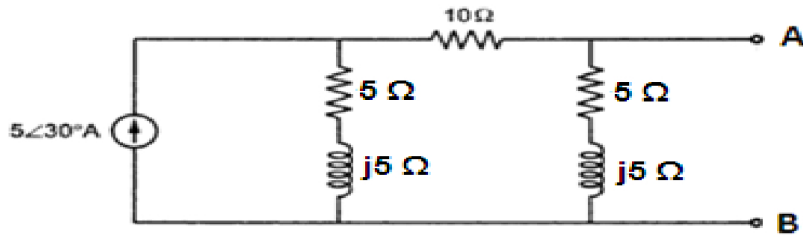
b) Draw the dual circuit of the following circuit. (5)



14. Using superposition theorem, find the current through the  $120\Omega$  resistor shown in figure.



15. Find the voltage across AB using Norton's theorem



16. A series RC Circuit with  $R=5000\ \Omega$  and  $C=20\ \mu\text{F}$  has a constant voltage  $V=100\text{ V}$  applied at  $t=0$  and the capacitor has no initial charge. Find the equations for  $V_R(t)$ ,  $i(t)$  and  $V_C(t)$

17. a) Draw and Explain the S-Domain circuit model for a Resistor (5)  
 b) Draw and Explain the S-Domain circuit model for an Inductor (5)

18. Define the following filters and draw their ideal characteristics.

- (i) Low Pass filter    ii) High Pass filter    iii) Band Pass filter    iv) Band Stop Filter

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