*3238*

C09-EC-306

# 3238

## BOARD DIPLOMA EXAMINATION, (C-09)
## OCTOBER/NOVEMBER-2018
## DECE- THIRD SEMESTER EXAMINATION

CIRCUIT THEORY

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

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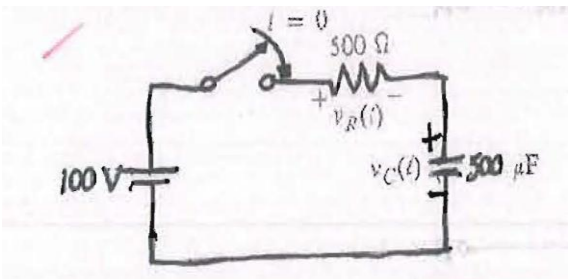
**PART-A**

3X10=30

***Instructions :***

1. Answer **All** questions.
2. Each question carries **Three** marks.
3. Answer should be brief and straight to the point and shall not exceed five simple sentences.

1. The ractance of a coil at 100Hz is 20Ω. What is its reactance at 1kHz?
2. List three applications of resonance.
3. Distinguish between D.C. and A.C.
4. Define the following (a) Driving point admittance (b) Transfer admittance.
5. Mention the limitations of Ohm's law.
6. State the super position theorem.
7. A 160m A current source has an internal resistance of 10kΩ. How much current will flow in a 2.5kΩ load connected across its terminals.
8. For the circuit shown in figure, write the mathematical expression for the voltage $V_c$ (t) after the switch is closed.



9. Draw the circuit o High pass RC circuit.

10. When does double humps formed in the frequency response of a double tuned circuit?

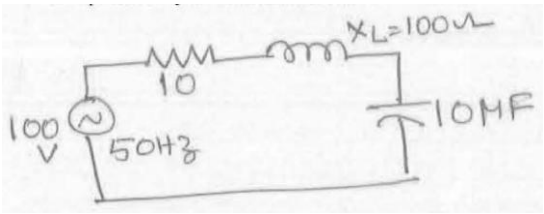
**PART-B**

10X5=50

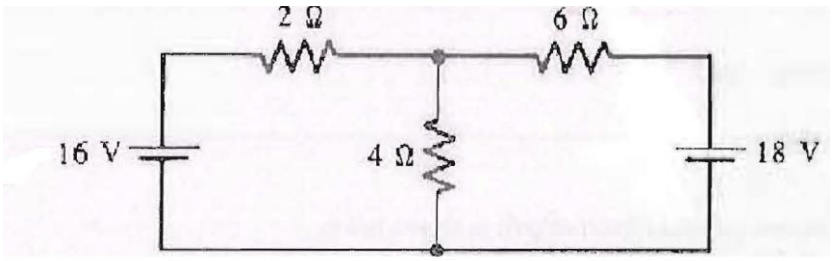
***Instructions :*** 1. Answer any **Five** questions
2. Each question carries **ten** marks.
3. Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. (a) A sinusoidal voltage v(t)= 100 Sin 100t is applied across a pure capacitor of 10uF. Determine (i) Current i (t) and ii) instantaneous power p (t).
(b) The ac voltage across a 10uF capacitors is v(t)=50 sin (500t). Determine i) the capacitive reactance and ii) the peak value of the current through the capacitor.

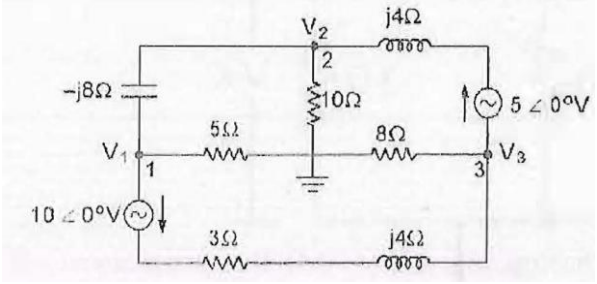
12. For the circuit shown below determine the total current. The phase angle and total Impedance in the circuit.



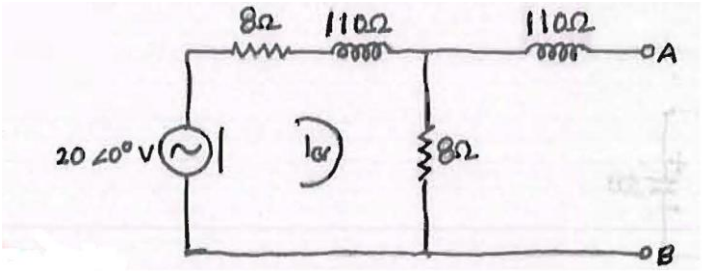

13. Using Mesh analysis find the current in each resistor shown in figure below



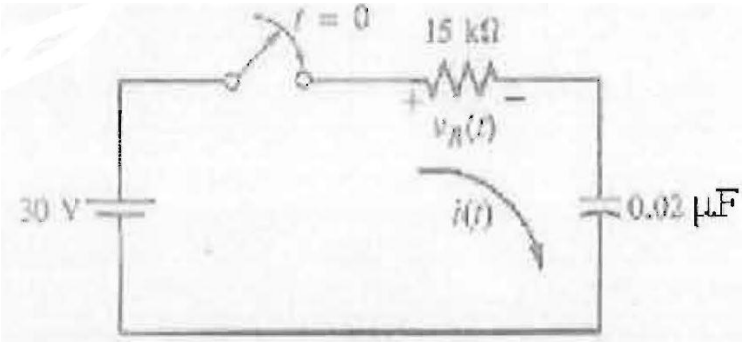

14. Write the node voltage equations for the network shown below and express them in matrix form.



15. Obtain the Thevenin's equivalent circuit at the terminal AB for the circuit shown figure.




16. (a) Define ideal voltage source and ideal current source.
    (b) A constant current source develops a terminal voltage of 9V when a 500Ω resistor is connected across its terminals voltage when the 500Ω resistor is replaced by a 1.5kΩ resistor?
17. For the circuit shown below
    (a) Find the time constant
    (b) After how many time constants will the current have decayed to one-half its maximum value?




18. Two coils with inductances in the ratio of four to one have coupling coefficient k=0.6 when these coils are connected in series aiding, the equivalent inductance is 44.4mH.Find $L_1$ $L_2$ and M.

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