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Question Paper Code : 51496

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

Second Semester

Electrical and Electronics Engineering

EE 2151/EE 25/EE 1151/080280005/10133 EE 205 – CIRCUIT THEORY

(Common to Electronics and Instrumentation Engineering/Instrumentation and Control Engineering)

(Regulations 2008/2010)

Time : Three Hours **Maximum : 100 Marks**

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. State Kirchoff's current law and voltage law.

2. Convert the voltage source shown in Fig. 2 into equivalent current source.

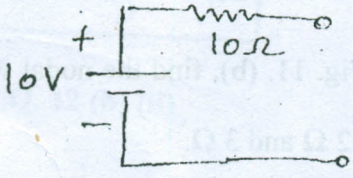

Fig. – 2

3. State the voltage division principle for two resistor in series and the current division principle for two resistors in parallel.

4. State Maximum power transfer theorem.

5. Define quality factor Q of a coil.

6. Sketch the frequency response of double tuned circuit.

7. What is meant by transient time ?

8. Write the purpose of Laplace transformation in the circuit analysis.

9. Draw the circuit diagram for a three phase delta connected source and a star connected load.

10. Write the expression for power for single phase and three phase AC circuit.

PART – B (5 × 16 = 80 marks)

11. (a) In the circuit shown in Fig. 11 (a), find the loop currents and the current through the 10 Ω and 5 Ω resistance along with their direction of flow. **(16)**

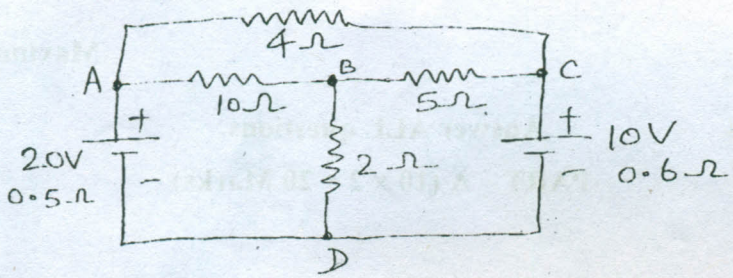

Fig. 11(a)

OR

(b) In the circuit shown in Fig. 11. (b), find the nodal voltages V_1, V_2 and V_3 and the current through 1 Ω, 2 Ω and 3 Ω. **(16)**

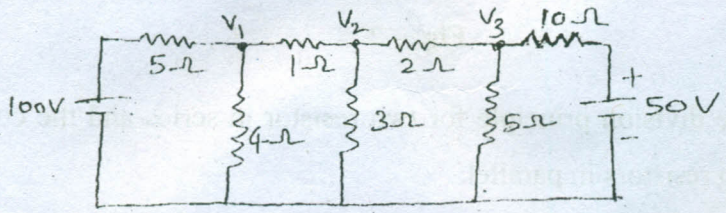

Fig. 11(b)

12. (a) (i) Explain the source transformation technique. **(6)**

(ii) Use the superposition theorem to find the current through 4 Ω resistor in the circuit shown in Fig. Q. 12. (a) (ii). **(10)**

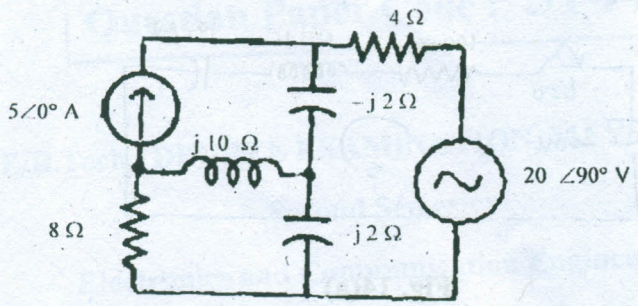

Fig. Q. 12 (a) (ii)

OR

(b) (i) Derive expression for star connected resistances in terms of delta connected resistances. **(8)**

(ii) Find the current through branch a-b of the network shown in Fig. Q. 12. (b) (ii) Using Thevenin's theorem. **(8)**

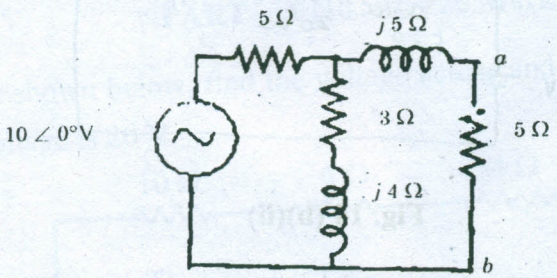

Fig. Q. 12 (b) (ii)

13. (a) A RLC series circuit has R = 60 Ω, L = 160 mH and C = 160 μf. Find the resonant frequency under resonant condition obtain the current, power and the voltage drops across the various elements if the applied voltage is 300 V. **(16)**

OR

(b) Illustrate the amplification factor with respect to frequency and coefficient of coupling of a single tuned circuit in detail. **(16)**

14. (a) A series RLC circuit with R = 100 Ω, L = 0.1 H and C = 100 μF has a DC voltage of 200 volts applied to it at t = 0 through a switch. Find the expression for the transient current. Assume initially relaxed circuit conditions.

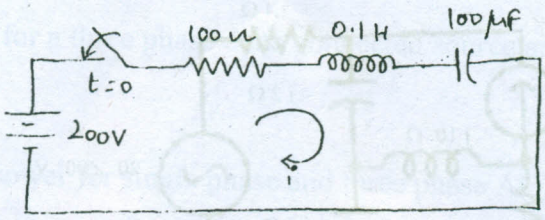

Fig. 14(a)

OR

(b) (i) Define natural response and transient response. (4)

(ii) In the circuit shown in figure. Q. 14. (b) (ii) find the time when the voltage across the capacitor becomes 25 V, after the switch is closed at t = 0. (12)

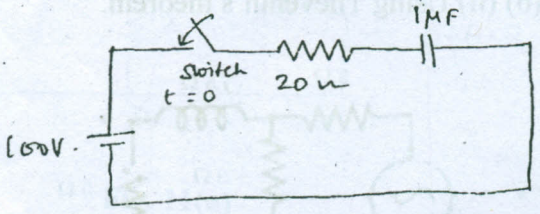

Fig. 14 (b)(ii)

15. (a) In a three phase three wire balanced system supplying power to a balanced three phase delta load find out the currents in all branches and lines. (16)

OR

(b) Describe the three phase power measurement by two wattmeter method. (16)
