Reg. No. | | | | | | | | | | | | |

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.

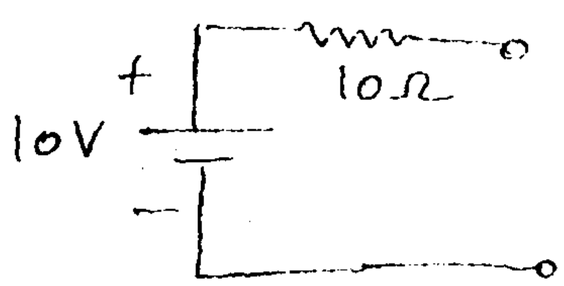

Fig. – 2

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)**

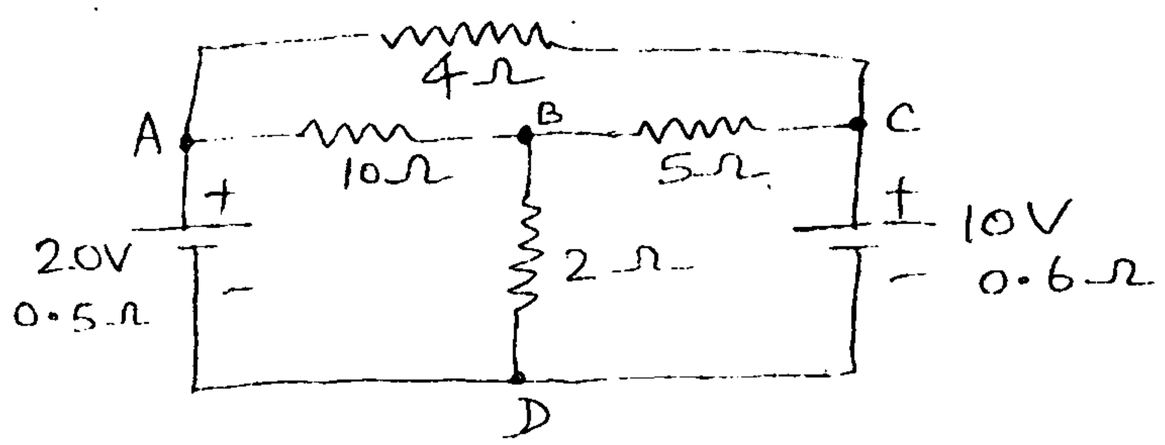

Fig. 11(a)

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)**

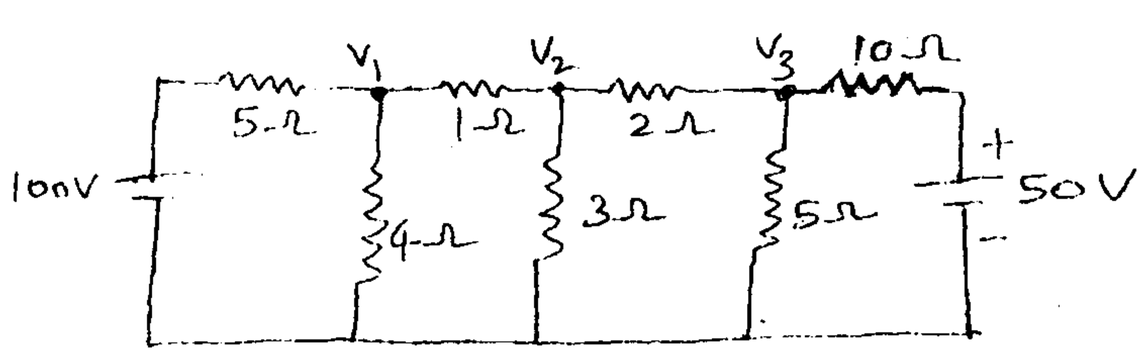

Fig. 11(b)

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)**

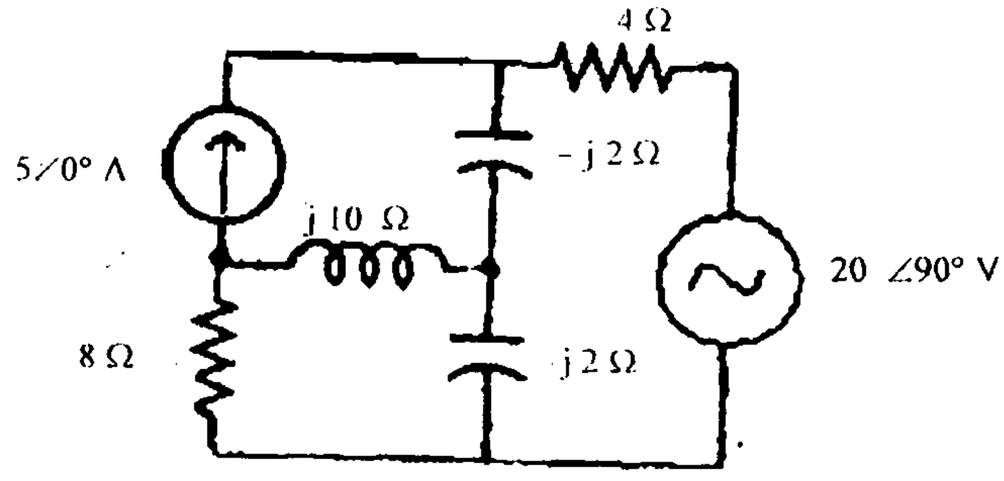

Fig. Q. 12 (a) (ii)

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)**

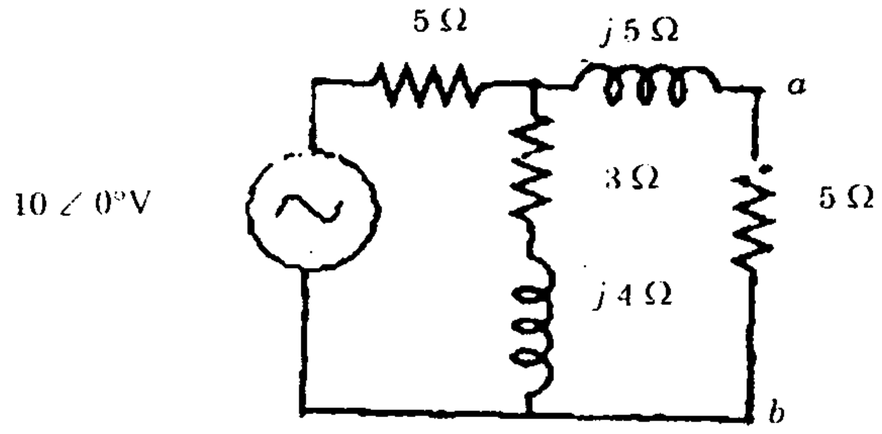

Fig. Q. 12 (b) (ii)

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.

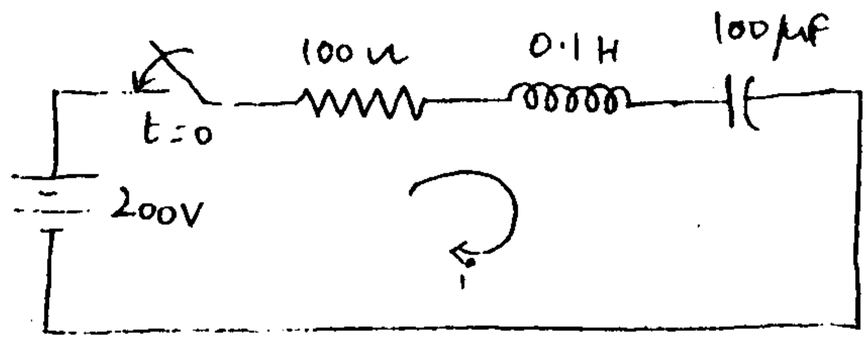

Fig. 14(a)

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)**

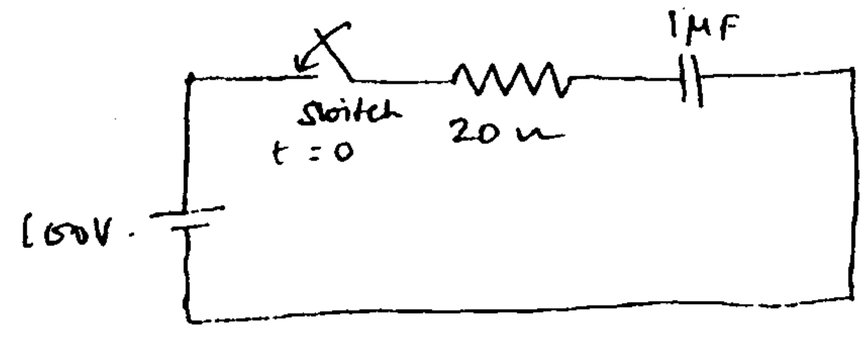

Fig. 14 (b)(ii)

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)**