

BASIC ELECTRICAL ENGINEERING

Paper : ES-101(A)

Opt. (I)

Time : Three Hours]

[Maximum Marks : 75]

Note : Attempt five questions selecting at least one question from each unit.

UNIT-I

- 1. (a) Using Mesh analysis, determine the current in the $4\ \Omega$ -branch in the circuit shown in Fig. 1.** 8

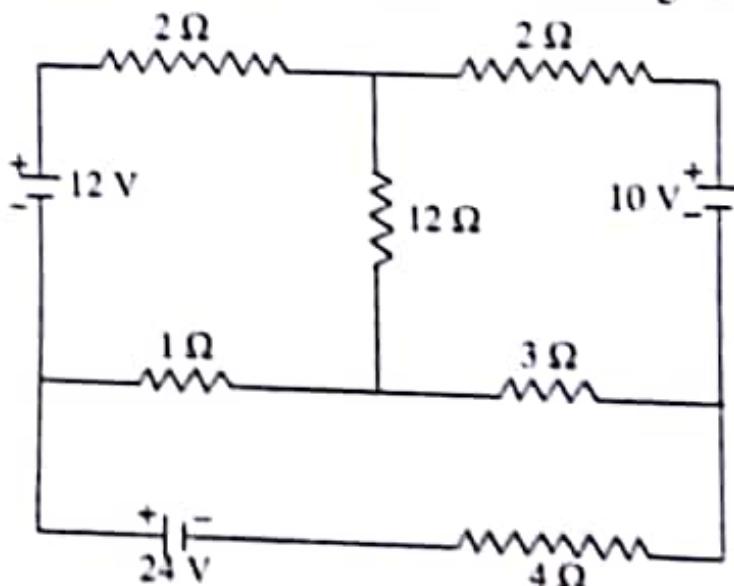
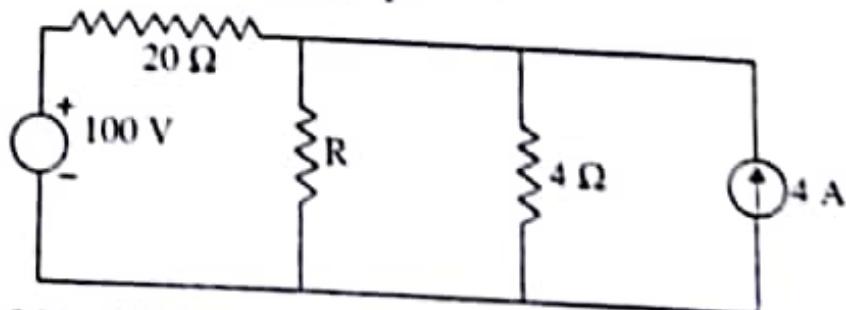


Fig. 1.

- (b) For the circuit shown in Fig. 2, find out the value of R for maximum power transfer, and also find out the maximum value of power.** 7



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Fig. 2.

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2. (a) Using Node voltage method, find V_s for $I_o = 7.5 \text{ mA}$ 8
 as shown in Fig. 3.

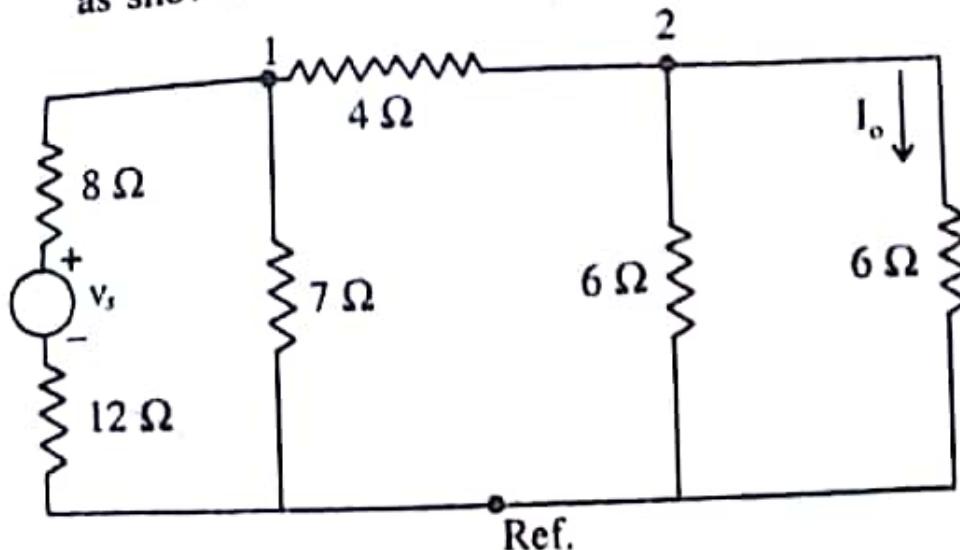


Fig. 3.

- (b) Calculate the current through 2Ω in the circuit shown in Fig. 4 using Superposition theorem. 7

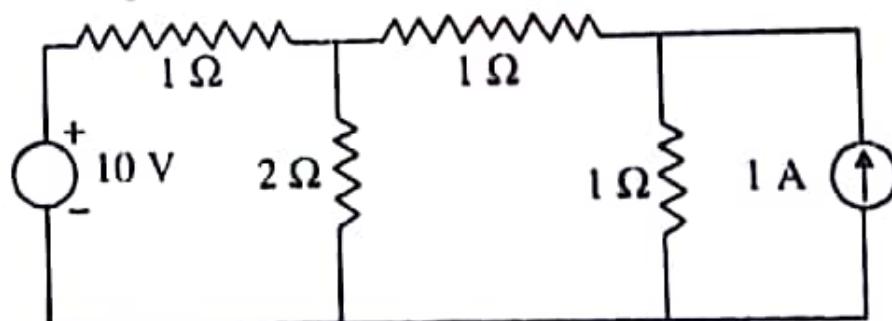


Fig. 4.

UNIT-II

3. (a) Calculate the r.m.s. and average value for the waveform shown in Fig. 5. (4+4)

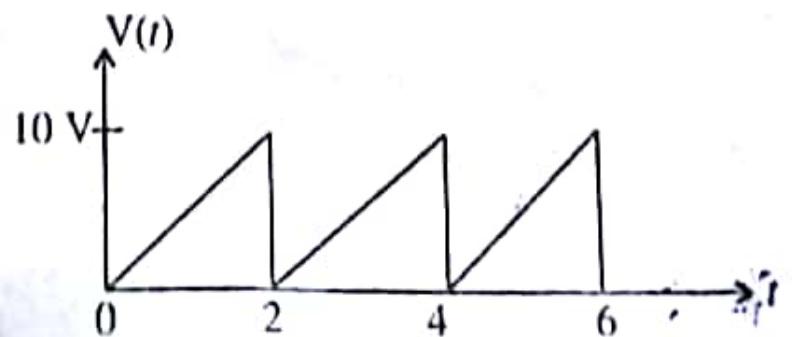


Fig. 5.

- (b) Find selectivity, Q factor, half power frequencies and bandwidth for Parallel RLC resonance circuit. 7

4. (a) Find the sum of sine current given as follows : 8

$$i_1 = 12 \sin(\omega t + 30^\circ); i_2 = 20 \sin(\omega t + 60^\circ),$$

$$i_3 = 18 \sin \omega t; i_4 = 25 \cos(\omega t); i_5 = 10 \cos\left(\omega t + \frac{2\pi}{3}\right).$$

- (b) Draw and explain resonance and bandwidth curve for series RLC resonance circuit. 7

UNIT-III

5. (a) Describe Three-phase delta connection with diagrams. 8

- (b) Explain OC and SC tests in detail. 7

6. (a) Describe the measurement of 3-phase power by 2-wattmeter method for star connection. 8

- (b) Write a note on the losses and efficiency of a single phase transformer. 7

UNIT-IV

7. (a) Explain the construction and working of dc machines with commutator action. 8

- (b) Describe the various types of wires and cables. 7

8. (a) Explain the construction and working principle of synchronous generator and motor. 8
- (b) Differentiate between MCB, ELCB and MCCB. 7
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