Roll No. ..... Total Pages : 3

BT–1/D-23 **41044**

BASIC ELECTRICAL ENGINEERING

Paper–ES–101A

Time Allowed : 3 Hours] [Maximum Marks : 75

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. All questions carry equal marks.

UNIT–I

1. (a) A resistor R is connected in series with a parallel circuit comprising of two resistances 12 and 8 ohms respectively. The total power dissipated in the circuit is 96 watts when applied voltage is 24V. Calculate the value of R. 10

   (b) Explain Delta to Star transformation is case of resistor with diagram. 5

2. Find Thevenin's equivalent of circuit shown as Fig.1 (below), w.r.t. the load resistor of 12Ω. 15

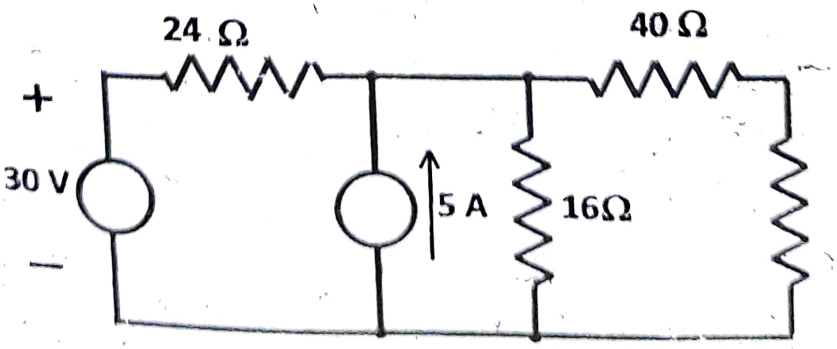

Fig.-1

UNIT–II

3. Derive the expression for average and r.m.s. value of a periodic sine wave for full cycle. 15

4. (a) Explain in detail the theory of AC frequency response of series R-L-C circuit including resonance and various waveforms. 10

(b) A series RLC circuit with $R = 20\ \Omega$, $L = 800$ mH and $C = 12\ \mu F$ is connected to an AC voltage source which has a maximum amplitude $V_m = 200$ V, Find :

(i) Resonant frequency ω_0.

(ii) The rms current at resonance.

(iii) Let the driving frequency be $\omega = 2000$ rad / s. then find compute Z and P.F. 5

UNIT–III

5. Explain in detail the two wattmeter method of power measurement for any type of (star or delta connected) load with suitable steps containing equations, neat circuit and phasor diagram. 15

6. (a) Describe the construction details of single phase transformer. 5

(b) Explain various types of losses occurring in a transformer. 5

(c) Deduce the condition of maximum efficiency of a single phase transformer. 5

UNIT–IV

Explain in detail the construction of a DC motor and working of commutator using neat sketches. 15

Explain the working principle of capacitor start capacitor run type single phase induction motor with neat circuit diagram. 15