Roll No. ..... Total Pages : 04

BT-2/M-19 32043

BASIC ELECTRICAL ENGINEERING

ES-101A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit.

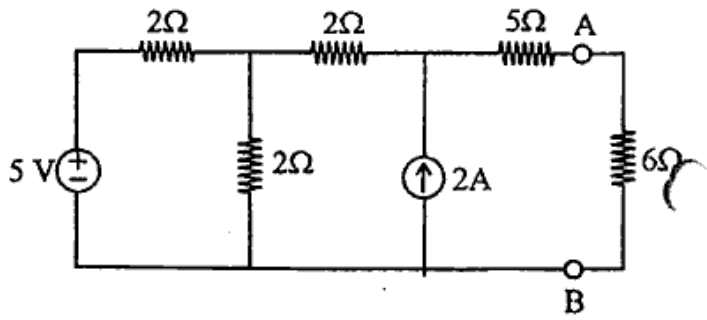
Unit I

1. (a) Explain Nodal current method with example in detail. http://www.kuonline.in 5

   (b) A resistor R is connected in series with a parallel circuit containing of two resistors having resistance of 12 and 8 ohm, respectively. The total power dissipated in the circuit is 96 watt and applied voltage is 24 V. Calculate the value of R. 5

   (c) Three resistor R, 2R and 3R are connected in detla. Determine the resistance for an equivalent star connected. 5

2. Find Norton's and Thevenin's equivalent circuit w.r.t resistor of 6Ω. 15



Unit II

3. (a) The voltage applied to a circuit is $100\sqrt{2}\sin(100\pi t)$ volts and the circuit draws a current of $100\sqrt{2}\cos(100\pi t + \pi/4)$ ampere. Taking voltage as the reference phasor, find the phasor representation of the current is ampere. 5

   (b) A coil resistance 10Ω and inductance 0.14H is connected in series with a capacitor of 150μF across a 200 V, 50 Hz supply. Calculate voltage across coil and capacitor.

   (c) Draw nearly the voltage waves on simultaneous time scale : 5
   $V_1 = V_m\sin \omega t$, $V_2 = V_m\sin(\omega t - 120°)$, $V_3 = V_m\sin(\omega t - 240°)$. 5

4. (a) Explain in detail the theory of sinusoidal frequency response of parallel RLC circuit, including condition of resonance. 10

(b) What do you mean by power factor ? Explain drawbacks of low power factor. 5

Unit III

5. (a) Establish relation between line current and phase current in a 3-phase delta connected balanced power system. 5

(b) Describe two wattmeter method for power absorbed in three phase balanced load. And also explain the effect of power factor on two wattmeter readings. 10

6. (a) Draw and explain equivalent circuit of a 1-phase transformer when primary parameters referred to secondary side and vice versa. Also write label (name/meaning) of each parameter. 10

(b) Explain load test on single phase-transfer transfer with phasor diagrams. 5

Unit IV

7. (a) Explain the working principle of three-phase Induction Motor and establish relation between slip frequency of rotor current. 5

(b) Derive the equation for torque develop in three phase induction motor. 5

(c) Explain different types of D.C. generator with circuit diagrams. 5

8. Write short notes on any *three* of the following : 15

(i) LT switch gear

(ii) Types of wires and cables

(iii) Synchronous motor

(iv) Earthing.