

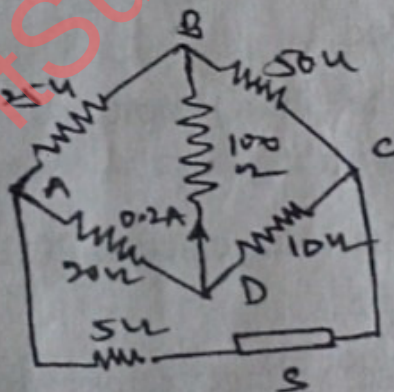
**BT-1/DX: 8032****EE-101-E: Electrical Technology**

Time : Three Hours

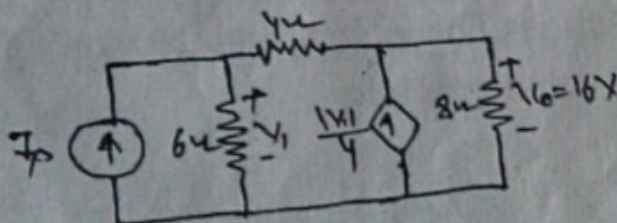
Maximum Marks : 100

Note:- Attempt any five questions. All question carry equal marks.

- Q.1. a) Use Kirchoff's law to determine magnitude of and poearity of source 's' of current flowing through branch BD is 0.2A from D to B for the circuit shown below. 10



- b) Applying KCl, determine current  $I_s$  in the electric circuit shown below  $V_o = 16V$  across 84 resistor. 10



Q.2. a) A circuit consist of 54 resistor, a coil of resistance 44 and inductive reactance 64 and a capacitor of reactance on connected in series across a 240V, 50Hz supply. calculate the current, its phase angle and power factor. 10

b) Describe the following terms

i) Power factor

ii) Polar and Exponential representation

iii) Phase angle

iv) r.m.s. value

2.5x4=10

Q.3. a) A coil of 10 H inductance and  $5\Omega$  resistance is connected in parallel with  $20\Omega$  resistor across 100V dc supply which's suddenly disconnected find. 2.5x4=10

i) The initial note of change of current after switching.

ii) The voltage across  $20\Omega$  resistor initially and after 0.3S.

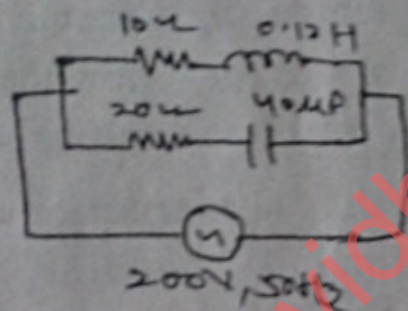
iii) The voltage across the switch contacts at the instant of seperation.

iv) The rate at which the coil is losing energy 0.3S after switching.

b) Define Theuenin's and Norton's Theorem with suitable example. 5+5

- Q.4. a) Define series resonance. Draw reactance current for individual and total reactance current for series R-L-C circuit and show the point of resonance. Derive expression of bandwidth in terms of circuit parameters. 10

- b) For a circuit shown below, calculate  
 i) Current in each branch (ii) source current  
 iii) power factor. Draw phase diagram showing all currents with reference to voltage.



- Q.5. a) Show that two watt meter method can measure the power of a three-phase circuit. Also derive the expression of power factor in terms of wattmeter readings. 6+4

- b) Show that

$$V_L = \sqrt{3} V_{\text{phase}} \quad \Delta \text{ Connection} \quad 5+5$$

$$I_L = \sqrt{3} I_{\text{phase}} \quad \Delta \text{ Connection}$$

- Q.6. a) What are different losses in a transformer? Derive condition for maximum efficiency for a transformer. 5+5

- b) Explain the construction and working principle of a single phase transforman. 5+5

Q.7. a) With neat sketch, explain the constructial feature of a dc machine. 10

- b) Explain the armature and fild control method for speed control of a dc slunt motor. Also give their typical applications.

Q.8. a) Draw the torque slip characteristics of a 3phase induction motor. Also show that maximum torque is independent of the rotor resistance.

- b) Explain the constructional feature of a synchronomous machine. Also give the advantages stationary armature.