



Paper Id: 120101

Roll No:

**SECTION C**

**3. Attempt any one part of the following: 10 x 1 = 10**

| Qno. | Question   | Marks | CO |
|------|--|-------|----|
| a.   | Using superposition, find the current flowing through 2 ohm resistance in following circuit (fig-2).<br><br><div style="text-align: center;"> <p style="text-align: right;">Fig (2)</p> </div> | 10    | 1  |
| b.   | Derive an expression of delta to star and star to delta transformation with example and satisfy the condition of both expressions.   | 10    | 1  |

**4. Attempt any one part of the following: 10 x 1 = 10**

| Qno. | Question  | Marks | CO |
|------|---|-------|----|
| a.   | Derive an expression of resonance frequency in series resonance circuit. If the bandwidth of a resonant circuit is 10 KHz and the lower half power frequency is 120 KHz, find out the value of the upper half power frequency and the quality factor of the circuit.            | 10    | 2  |
| b.   | Derive the relationship between line and phase current & voltage for a star connected 3-phase balanced system. A balanced delta connected load of $(12 + j 9) \Omega$ / phase is connected to 3-phase 400 V supply. Calculate line current, power factor and power drawn by it. | 10    | 2  |

**5. Attempt any one part of the following: 10 x 1 = 10**

| Qno. | Question  | Marks | CO |
|------|---|-------|----|
| a.   | Draw and explain the no load and full load phasor diagrams for a single phase transformer.  | 10    | 3  |
| b.   | (i) Explain single phase Auto transformer and give its application.<br>(ii) In a 25 KVA, 2000/200 V transformer, the constant and variable losses are 350 W and 400 W respectively. Calculate the efficiency on unity power factor at (i) full load and (ii) half load. | 10    | 3  |

**6. Attempt any one part of the following: 10 x 1 = 10**

| Qno. | Question  | Marks | CO |
|------|---|-------|----|
| a.   | Draw the slip-torque characteristics of three phase induction motor. A 3-phase, 50 Hz induction motor has 6 poles and operates with a slip of 5 % at a certain load. Determine (i) the speed of the rotor with respect to the stator (ii) the frequency of rotor current (iii) the speed of the rotor magnetic field with respect to rotor. | 10    | 4  |
| b.   | (i) Describe any one method of starting single phase induction motor with neat diagram.<br>(ii) Why Synchronous motor is not self starting?   | 10    | 4  |

**7. Attempt any one part of the following: 10 x 1 = 10**

| Qno. | Question  | Marks | CO |
|------|---|-------|----|
| a.   | Explain the requirement of earthing for electrical equipment. What is the difference between neutral and earthing                                     | 10    | 5  |
| b.   | Name the various cables used in electrical system based on insulation. Explain any two. What are the features of good conductor in electrical circuit | 10    | 5  |