Sub Code: BEET 101 **ROLL NO……..……..**

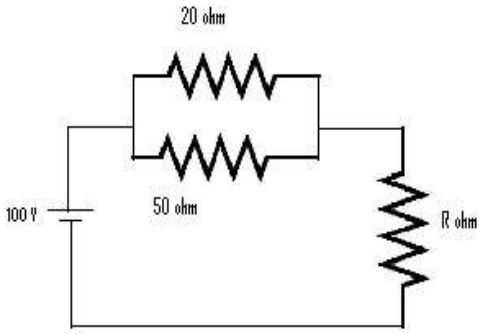
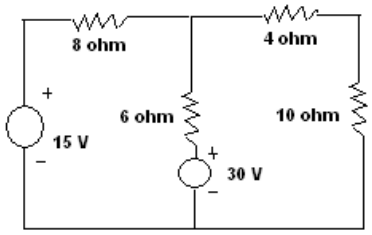
END SEMESTER EXAMINATION, 2022 – 23

I Year, II Semster B.Tech.

Basic Electrical Engg.

Duration: 3:00 hrs **Max Marks: 100**

Note: - Attempt all questions. All Questions carry equal marks. In case of any ambiguity or missing data, the same may be assumed and state the assumption made in the answer.

Q 1.	**Answer any four parts of the following.** **a)** Explain voltage and current source. Also define ideal voltage and ideal current source. **b)** Determine the value of the resistance R ohm Shown below if potential drop across it is 25 volts  **c)** State maximum power transfer theorem. Derive condition for maximum power transfer to a purely resistive load **d)** Determine current in 10ohm resistance using Mesh analysis.  **e)** Establish a relationship between Line voltage, Phase voltage and Line current, Phase current for a star connected three phase A C system. **f)** Explain BH Curve in detail with suitable diagram.	5x4=20
Q 2.	**Answer any four parts of the following**. **a)** Derive the expression for RMS value of a sinusoidal waveform. Define Form factor and peak factor. **b)** Define apparent power, active power, reactive power and power factor. **c)** A resistance of 100 ohm is connected in series with a 56 microfarad capacitor to a supply at 230 V, 50Hz .Calculate (i) impedance (ii) current (iii) power factor (iv) voltage across the resistor and across the capacitor. **d)** Explain resonance for series AC circuit in detail. Also define quality factor.	5x4=20

	e) Three similar coils are connected in a star system and take a total power of 1.5KW at a power factor of 0.2 Lagging from a 3 phase 400V, 50 Hz, supply Calculate Resistance and Inductance of each coil. **f)** Derive the expression for total power measurement of 3 phase system with two wattmeter method with suitable diagram.	
Q 3.	**Answer any two parts of the following.** **a)** Write down the similarities and dissimilarities between electric and magnetic circuit. A steel ring 30 cm mean diameter and of circular section 2cm diameter has an air gap of 1mm long. It is wound uniformly with 600 turns of wires carrying current of 2.5 A. Find (1) total MMF (2) total Reluctance (3) Magnetic flux. Neglect magnetic leakage. The iron path takes 40% of the total MMF. **b)** Define working principle of single phase transformer. Drive expression for EMF equation of single phase Transformer. Also enlist various losses occur in a transformer and deduce condition for maximum efficiency. **c)** The following reading were obtained from OC and SC tests on 8kVA, 400/100V, 50 Hz single phase transformer: Open circuit test (LV side): 100Volt 4Amp. 60watt Short circuit test (HV side): 10 volts 20Amp. 100watt **Calculate (i)** Calculate the transformer parameter from above test result. **(ii)** Efficiency at full load and 0.8 power factor **(iii)** Calculate the load at which maximum efficiency occurs and also find Maximum efficiency at 0.8 power factor lagging	10x2= 20
Q 4.	**Answer any two parts of the following.** **a)** What is rotating magnetic field? Explain the construction and working principle of 3-phase induction motor. **b)** What is the importance of back emf in DC Motor? Also explain different types of DC motor with neat diagram. **c)** Explain why single phase induction motor is not self-starting motor. List the various starting method use for single phase induction motor it and also explain any one method in detail.	10x2= 20
Q 5.	**Answer any two parts of the following.** **a)** Define the following **(i)** Switch fuse unit **(ii)** Types of wire use in electrical installation **b)** What is Battery? Explain different type of Batteries. Also mention important characteristics of batteries **c)** 4 tube lights of 40w each, 2 fans of 60w each, a television of 100w and an air conditioner of 1kw are used for 6hrs daily .Find the cost of electrical energy for 30 days. If 1 unit of energy costs Rs2.50.if operating time of each reduce to half then how much saving is possible.	10x2= 20

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