Sub Code:BEET101 **ROLL NO……..……..**

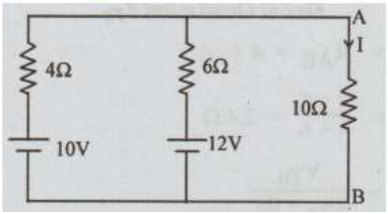
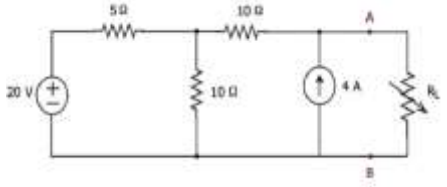
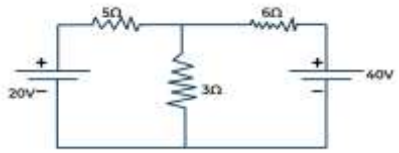
ODDSEMESTER EXAMINATION, 2024 – 25

First Year (First Sem) B.Tech.

Basic Electrical Engineering

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 two parts of the following. [Unit-1]	(10x2= 20)
	a) (i)Find the current through 10 Ω resistance using Thevenin's Theorem	(5 marks)
		
	(ii)Explain maximum power transfer theorem and derive the condition of maximum power to be transferred from source to load.	(5 marks)
	b) Find the maximum power that can be delivered to the load resistor R_L of the circuit shown in the following figure and also find the value of maximum power.	(10 marks)
		
	c) Find the current through 3Ω resistor using superposition theorem.	(10 marks)
		
Q 2.	Answer any two parts of the following.	(10x2= 20)
	a) (i)Describe different types of electrical power.	(5 marks)
	(ii)A 220 V,50 Hz AC supply is applied to a coil of 0.2 H inductance and 20 Ω resistance connected in series with a capacitor of 100 μF. Calculate Impedance, Circuit current, Power factor of the circuit.(5 marks)	
	b) Derive the relationship between line & phase quantities in three phase star connected system.	(10 marks)
	c) Derive the equation of power factor for a three phase system using two wattmeter method of power measurement.	(10 marks)
Q 3.	Answer any two parts of the following.	(10x2= 20)
	a) (i)Explain different types of losses that occur in transformer.	(5 marks)
	(ii)Discuss the analogy between electric and magnetic circuit.	(5 marks)

	b)A 25 KVA, 2200/220 V, 50 Hz, single phase transformer has following parameters, R_1=1.75 Ω, R_2=0.0045 Ω, X_1=2.6 Ω, X_2=0.0075 Ω. Calculate equivalent resistance and Equivalent reactance referred to primary & secondary side. (10 marks) c) Derive the condition of maximum efficiency in transformer. (10 marks)
Q 4.	Answer any two parts of the following. (10x2= 20) a) (i)A 3-phase ,4 pole Induction motor is supplied from 3 phase ,50 Hz AC supply, calculate 1. Synchronous speed, 2. Rotor speed when slip is 4% 3. Rotor frequency when rotor runs at 600 rpm. (5 marks) (ii)Describe different methods of speed control of DC motor. (5 marks) b) Explain the working principle of single-phase induction motor and describe any one method of it's starting. (10 marks) c) Describe torque-slip and torque-speed characteristics of three phase induction motor with neat diagram. (10 marks)
Q 5.	Answer any two parts of the following. (10x2= 20) a) (i)Give a brief introduction of MCCB and SFU. (5 marks) (ii)Name the different types of batteries and differentiate between primary and secondary cell(5 marks) b)Describe Generalized layout of power system using single line diagram with clear indication of different voltage levels. (10 marks) c)Calculate the electricity bill amount for a month of 30 days if following are used as specified: (10 marks) i. 4 Bulb of 50 W for 6hrs ii. 3 Tubelight of 40 W for 8hrs iii. A Television of 100W for 6 hrs iv. A Refrigerator of 300 W for 24hrs. Cost per unit is Rs 2.50.

****