CBCS SCHEME

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BESCK104B

First Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026
Introduction to Electrical Engineering

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. VTU Formula Hand Book is permitted.
3. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Write the general structure of electrical power system using single line diagram approach and explain briefly.	06	L2	CO5
	b.	With neat diagram, explain Hydro-electric power plant.	08	L2	CO1
	c.	The current in 6 Ω resistance of network shown in Fig.Q1(c) is 2A. Determine current in all branches and applied voltage.	06	L3	CO2

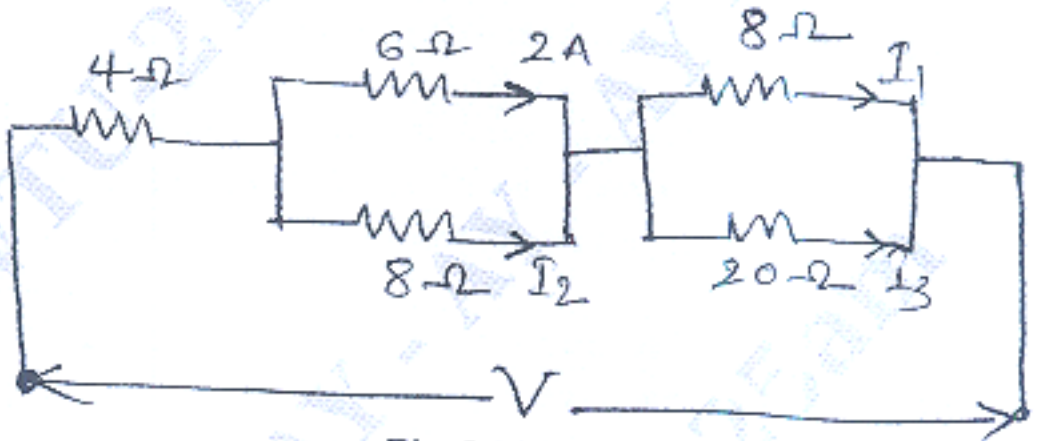


Fig.Q1(c)

OR

Q.2	a.	What are conventional and non conventional energy resources? Explain briefly.	06	L2	CO1
	b.	With neat diagram explain Nuclear Power Plant.	08	L2	CO1
	c.	For the network shown in Fig. Q2(c), find current in all branches and power consumed in all resistances.	06	L3	CO2

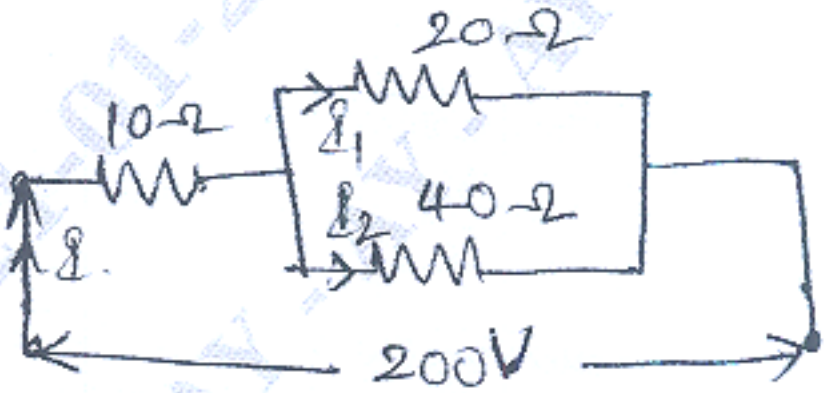
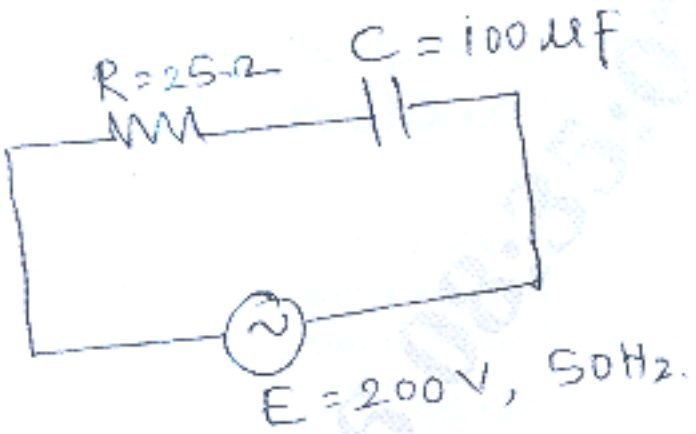


Fig. Q2(c)

		Module – 2			
Q.3	a.	Define (i) Power Factor (ii) Reactive Power (iii) Apparent Power and write their equations.	06	L2	CO2
	b.	Derive Equation for power in R-L series circuit excited by sinusoidal wave form.	08	L2	CO2

	c.	For the circuit shown in Fig. Q3 (c), find current, power factor and power consumed by circuit.  Fig. Q3 (c)	06	L3	CO2
		OR			
Q.4	a.	Define the following terms applied to alternating current wave: (i) Average value (ii) Form factor (iii) Peak factor	06	L2	CO2
	b.	Mention the advantages of 3-ϕ system over 1-ϕ system.	06	L2	CO2
	c.	When 3-balanced impedances are connected in star, across a 3-ϕ, 415 V, 50 Hz supply, the line current drawn is 20 A at a lagging p.f. of 0.4. Determine parameters of impedance in each phase.	08	L3	CO2
		Module – 3			
Q.5	a.	Derive EMF equation of D.C. Generator.	06	L3	CO3
	b.	With neat diagram, explain construction details of D.C. generator.	08	L2	CO3
	c.	The induced emf in d.c. generator running at 1500 rpm is 500 V, (i) Calculate induced emf, when it runs at 1000 rpm, the flux remains constant. (ii) Find percentage increase in flux, so that the induced emf at 1200 rpm is 600 V.	06	L3	CO3
		OR			
Q.6	a.	Derive Torque equation of D.C. Motor.	06	L2	CO3
	b.	Explain characteristics of D.C. Shunt motor, (i) $\frac{T_a}{I_a}$ (ii) $\frac{N}{I_a}$ (iii) $\frac{N}{T_a}$	06	L2	CO3
	c.	A shunt d.c. machine connected to 250 V supply, has an armature resistance of 0.12 Ω and field resistance of 100 Ω. Find ratio of speed of machine as a generator to speed of motor, the line current in each case is 80 A.	08	L3	CO3
		Module – 4			
Q.7	a.	With neat diagram, explain construction and working of 1-ϕ transformer.	08	L2	CO4
	b.	Explain the losses in transformer.	06	L2	CO4

	c.	Find number of turns on primary and secondary side of a 440/230 V, 50 Hz, 1-ϕ transformer, if the net area of X-section of core is 30 cm^2 and maximum value of flux density is 1 wb/m^2.	06	L3	CO4
		OR			
Q.8	a.	Explain concept of rotating magnetic field in 3-ϕ. induction motor.	08	L2	CO4
	b.	Explain with neat diagram, construction of squirrel cage and wound rotor.	06	L2	CO4
	c.	A 3-ϕ 4-pole, 440 V, 50 Hz induction motor runs with slip of 4%. Find the rotor speed and frequency of rotor current.	06	L3	CO4
		Module – 5			
Q.9	a.	With neat diagram and truth table, explain 2-way control of lamp.	06	L2	CO5
	b.	What is earthing? Explain pipe earthing.	08	L2	CO5
	c.	Mention safety precaution to avoid shock.	06	L2	CO5
		OR			
Q.10	a.	What is tariff? Explain 2-part tariff.	06	L1	CO5
	b.	Explain working of FUSE and MCB.	06	L1	CO5
	c.	What is wiring? List the types of wiring. Give the advantages and disadvantages of casing and capping wiring.	08	L1	CO5

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