CBCS SCHEME

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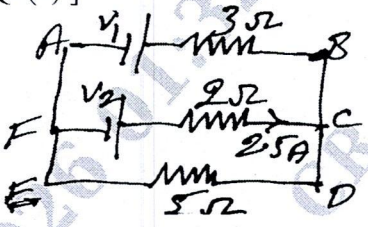
BESCK204B

Second 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
1	a.	Explain with block diagram power generation in solar power plant.	6	L1	CO1
	b.	Using single line diagram explain general structure of electrical power system.	6	L2	CO5
	c.	A 8 ohms resistor is in series with parallel combination of two resistors 60 ohms and 12 ohms. If the current in the 6 ohms resistor is 5A, determine the total power dissipated in the circuit. i. Find current in each resistor ii. Power dissipated in each resistor iii. Total power dissipated in the circuit.	8	L3	CO2
		OR			
2	a.	State Ohm's law, KCL and KVL. Also write limitations of Ohm's law.	6	L1	CO2
	b.	Explain with block diagram, power generation in nuclear power plant.	7	L2	CO1
	c.	Determine the magnitude and direction of current through 3 Ohms resistance and calculate the value of V_1 and V_2. When the power dissipated in 5 ohms resistor is 125 W. [Refer Fig.Q2(c)]  Fig.Q2(c)	7	L3	CO2
		Module – 2			
3	a.	Define the term : i) RMS value ii) Average value iii) Form factor iv) Crest value v) Frequency.	5	L1	CO2
	b.	For 1-ϕ AC series circuit consists of R and C, draw the phasor diagram and obtain the relation for voltage current and power.	10	L2	CO2
	c.	Obtain the relation for line voltage current and phase voltage and current in star connection.	5	L2	CO2
		OR			
4	a.	A series circuit with a resistor of 100Ω, capacitor of 25μf and inductance of 0.15H is connected across 220V, 50Hz supply. Calculate : i) Impedance ii) Current iii) Power iv) Power factor of circuit.	10	L3	CO2
	b.	State the advantages and limitations of generation of 3ϕ AC over 1ϕ AC quantity.	5	L1	CO2
	c.	Explain active power, reactive power and apparent power with equation and units for 1-phase AC quantity.	5	L2	CO2

		Module – 3			
5	a.	With usual notation derive the emf equation of a DC generator.	**4**	**L2**	**CO3**
	b.	A 4-pole, DC shunt motor takes 22A from 220 V supply, The armature and field resistors are respectively 0.5Ω and 100Ω. The armature is lap connected with 300 conductor. If the flux per pole is 20 MWb calculate the speed and gross torque.	**8**	**L3**	**CO3**
	c.	Explain the various characteristics of DC series motor and give its applications.	**8**	**L3**	**CO4**
		OR			
6	a.	Obtain the torque equation for DC motor.	**6**	**L2**	**CO3**
	b.	With circuit diagram give the relationship between induced emf and terminal voltage for DC shunt generator.	**6**	**L3**	**CO3**
	c.	Give the characteristics of DC shunt motor and its applications.	**8**	**L3**	**CO4**
		Module – 4			
7	a.	Derive the emf equation of a transformer.	**6**	**L2**	**CO3**
	b.	Find the number of turns on the primary and secondary side of a 440/230V, single phase transformer, if the net cross sectional area is 30 cm^2 and the flux density is 1 wb/m^2.	**7**	**L3**	**CO4**
	c.	Name the types of 3ϕ induction motor and give the difference between its types.	**7**	**L2**	**CO4**
		OR			
8	a.	With phasor diagram explain the concept of Rotating Magnetic Field (RMF).	**7**	**L2**	**CO3**
	b.	What are the different losses in transformer and how to overcome it?	**7**	**L2**	**CO3**
	c.	Find the η% of 150 KVA, transformer at i. Full load, UPf ii. 50% of full load, 0.8 pf, If the constant losses is 1400 W and variable losses is 1600 W.	**6**	**L3**	**CO4**
		Module – 5			
9	a.	With Truth table explain the two-way and three-way control of lamp.	**7**	**L3**	**CO5**
	b.	What is Tariff? Explain two-part Tariff?	**6**	**L2**	**CO5**
	c.	Explain the Plate Earthing with diagram.	**7**	**L1**	**CO5**
		OR			
10	a.	With neat diagram explain Pipe Earthing.	**7**	**L1**	**CO5**
	b.	Write short notes on fuse and MCB.	**7**	**L2**	**CO5**
	c.	Explain different types of domestic wiring.	**6**	**L1**	**CO5**

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