CBCS SCHEME

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BESCKB204/BESCK204B

Second Semester B.E./B.Tech. Degree Examination, June/July 2023
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.	With neat diagram, explain the general structure of electrical power systems using single line diagram.	8	L1	CO1
	b.	State and explain Kirchoff's laws.	6	L1	CO2
	c.	Two resistors connected in parallel across 100 V DC supply take 10 A from the line. The power dissipated in one resistor is 600 W. What is the current drawn when they are connected in series across the same supply?	6	L3	CO2
		OR			
Q.2	a.	State and explain Ohm's law and mention its limitations.	6	L1	CO2
	b.	With block diagram, explain the Hydel power generations.	6	L1	CO1
	c.	A coil of 12 ohms resistance is in parallel with a coil of 20 ohms resistance. This combination is connected in series with a third coil of 8 ohms resistances. The whole circuit is connected across a battery having an emf of 30 V and internal resistance of 2 ohms, calculate (i) The terminal voltage of the battery and (ii) The power in the 12 ohm coil.	8	L3	CO2
		Module – 2			
Q.3	a.	Define RMS value, Average value, Form factor and Peak factor.	8	L1	CO2
	b.	Show that current 'i' lags the applied voltage 'V' also power consumed is zero by 90° for a pure inductance A.C. circuit?	6	L1	CO2
	c.	Write a short note on advantages of 3-phase system.	6	L1	CO1
		OR			
Q.4	a.	Show that current 'i' leads the applied voltage 'V' also power consumed is zero by 90° for a pure capacitive A.C. circuit.	6	L1	CO1
	b.	With the help of circuit diagram and phasor diagram. Find the phase angle impedence and power in case of series R-L circuit.	8	L1	CO1
	c.	A series R-L circuit takes 384 watts at a power factor of 0.8 from a 120 V, 60 Hz supply. What are the values of R and L?	6	L3	CO2
		Module – 3			
Q.5	a.	Explain the working principle of DC motor with suitable diagrams.	8	L1	CO3
	b.	Derive an EMF equation for DC generator with usual notations.	6	L2	CO3
	c.	An 8-pole lap-connected armature has 960 conductors a flux of 40 mwb per pole and a speed of 400 rpm. Calculate the emf generated, if the armature were wave connected at what speed must it be driven to generate 400 V.	6	L3	CO3
		OR			

Q.6	a.	What is back emf in a DC motor? What is its significance?	6	L1	CO3
	b.	Explain the function of following parts of DC machine : (i) Yoke (ii) Field winding (iii) Commutator (iv) Pole shoe (v) Pole core (vi) Brush	8	L1	CO4
	c.	Derive an expression for armature torque in a DC motor.	6	L2	CO4
		Module – 4			
Q.7	a.	Derive an EMF equation of transformer with usual notations.	6	L2	CO3
	b.	With neat diagram, explain the construction of a core type and a shell type single phase transformer.	8	L2	CO3
	c.	Explain the production of rotating magnetic field in air gap of three phase induction motor.	6	L2	CO3
		OR			
Q.8	a.	Explain the working principle of single phase transformer.	6	L2	CO3
	b.	With a neat sketch, explain the constructional features of three phase induction motor.	8	L2	CO3
	c.	A 200 KVA, 10000 V/400 V, 50 Hz single phase transformer has 100 turns on the secondary calculate, (i) The primary and secondary currents. (ii) The number of primary turns. (iii) The maximum value of flux.	6	L3	CO3
		Module – 5			
Q.9	a.	With neat circuit diagram and switching table explain two-way and three-way control of lamps.	6	L1	CO5
	b.	What do you mean be earthing? Explain any one type earthing with a neat diagram.	8	L1	CO5
	c.	Definition of 'unit' used for consumption of electrical energy and explain the two-part electricity tariff.	6	L1	CO5
		OR			
Q.10	a.	What is Domestic wiring and explain casing and capping?	7	L1	CO5
	b.	Write short notes on : (i) Fuse (ii) MCB	6	L2	CO5
	c.	What are the precautions to be taken to prevent electric shocks?	7	L1	CO5

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