CBCS SCHEME - Summer Semester

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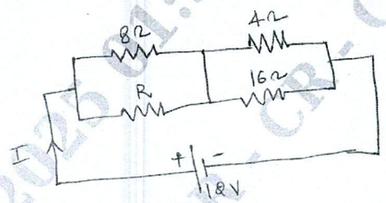
BESCK204B

Second Semester B.E/B.Tech. Degree Examination, June/July 2025
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. M : Marks , L: Bloom's level , C: Course outcomes.
3. VTU Formula Hand Book is permitted.

		Module – 1	M	L	C
1	a.	State and explain Kirchoff's laws.	6	L1	CO2
	b.	A resistance R is connected in series with a parallel circuit comprising of two resistance 12 Ω and 8 Ω. The total power in the circuit is 70 W, when the applied voltage of 20 V. Calculate R.	7	L3	CO2
	c.	With block diagram, explain the nuclear power generations.	7	L1	CO1
		OR			
2	a.	With neat diagram, explain the general structure of electrical power systems using single line diagram.	8	L1	CO1
	b.	State and explain ohm's law and mention its limitations.	6	L1	CO2
	c.	If the total power dissipated in the circuit shown below in Fig. Q2 (c) is 18 W. Determine (i) Value of R and its current (ii) Power consumed by 8 Ω resistor.  Fig. Q2 (c)	6	L3	CO2
		Module – 2			
3	a.	Show that, the power consumed by a pure capacitor is zero, when connected across A.C. supply.	7	L1	CO1
	b.	A resistance of 20 Ω is connected in series with a pure inductance of 0.05 H and the circuit is connected to a 230 V, 50 Hz, sinusoidal supply. Calculate (i) Circuit current (ii) Phase angle (iii) Power factor (iv) Power	8	L3	CO2
	c.	Write a short note on advantages of 3 phase system.	5	L1	CO1
		OR			
4	a.	A balanced three phase load of (8+j6) Ω per phase is connected to a three phase 230 V supply. Find the line current, power factor, reactive power and total power in the circuit when the load is connected in star.	7	L3	CO1

	b.	With the help of circuit diagram and phasor diagram, analyze the R-C series circuit and show that current leads the voltage.	7	L1	CO1
	c.	Define RMS value, Average value, Form factor.	6	L1	CO2
		Module – 3			
5	a.	With usual notation, derive the EMF equation of a DC generator.	6	L2	CO3
	b.	With a neat sketch, explain the construction of various parts of DC generator.	8	L1	CO3
	c.	Derive an expression for the torque developed by a DC motor.	6	L2	CO3
		OR			
6	a.	A 4 pole, 500 V shunt motor has 720 wave connected conductors on its armature. The full load armature current is 60 A and the flux per pole is 0.03 Wb. The armature resistance is 0.2 Ω and the contact drop is 1 V per brush. Calculate the full load speed.	7	L3	CO3
	b.	Explain the working principle of DC motor with suitable diagrams.	8	L1	CO3
	c.	Explain characteristics of DC shunt motor.	5	L1	CO3
		Module – 4			
7	a.	Explain the working principle of single phase transformer.	6	L2	CO3
	b.	A 10 pole induction motor supplied by a 6 pole alternator which is driven at 1200 rpm. If the motor runs at a slip of 3%, what is its speed and frequency of rotor induced emf.	6	L2	CO3
	c.	Explain the concept of rotating magnetic field in case of stator field of 3-phase induction machine with a neat diagram.	8	L3	CO3
		OR			
8	a.	Derive an EMF equation of transformer with usual notations.	7	L2	CO4
	b.	A 10 KVA, 400/200 V, single phase transformer has a maximum efficiency of 98% at 90% of the full load at 0.8 p.f. Find its efficiency at full load and 0.6 p.f.	7	L2	CO4
	c.	Define slip. Derive the expression for frequency of rotor current.	6	L2	CO4
		Module – 5			
9	a.	What is Domestic wiring and explain casing and capping?	7	L1	CO5
	b.	What is earthing? With a neat diagram, explain pipe earthing.	7	L1	CO5
	c.	Explain the working principle of Fuse and MCB.	6	L1	CO5
		OR			
10	a.	Define Tariff. Explain briefly the two part tariff with its advantages and disadvantages.	7	L1	CO5
	b.	What is electric shock? Give the list of preventive measures against the shock.	7	L1	CO5
	c.	With neat circuit diagram, and switching table, explain two-way and three-way control of lamps.	6	L1	CO5

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