CBCS SCHEME

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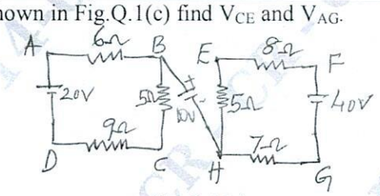
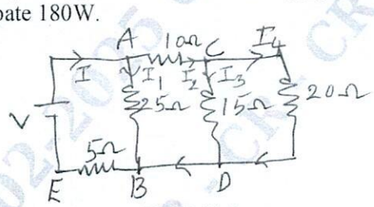
BESCK204B

Second Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.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. VTU Formula Hand Book is permitted.
3. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Explain a typical electric power system with the help of a labeled single line diagram.	8	L2	CO1
	b.	Draw and explain the working of solar photovoltaic power generation system.	6	L2	CO1
	c.	For the circuit shown in Fig.Q.1(c) find V_{CE} and V_{AG}.  Fig.Q.1(c)	6	L3	CO1
		OR			
Q.2	a.	List the advantages and disadvantages of conventional and non conventional energy sources.	7	L2	CO1
	b.	State and explain Kirchoff's laws as applicable to DC circuits.	5	L2	CO1
	c.	In the circuit of Fig.Q.2(c). Find the value of supply voltage V so that 20Ω resistor can dissipate 180W.  Fig.Q.2(c)	8	L3	CO2
		Module – 2			
Q.3	a.	Define the following terms applied to quantity AC: i) Average value ii) RMS value iii) Form factor iv) Frequency	6	L1	CO2

	b.	Establish the relation between voltage and current in ac circuit containing RL in series. Draw the vector diagram.	8	L3	CO2
	c.	List the advantages and limitations of 3ϕ AC over 1ϕ AC.	6	L2	CO2
		OR			
Q.4	a.	Draw the circuit diagram for three phase star and delta connection. Write the relation between line and phase voltage and currents.	6	L2	CO2
	b.	Define the terms active power, reactive power and apparent power.	6	L1	CO2
	c.	A series circuit with R = 10Ω, L = 50 mH and C = 100 μF is provided with 200 V, 50 Hz supply. Find: i) Impedance ii) Current iii) Power iv) Power factor.	8	L3	CO2
		Module – 3			
Q.5	a.	With a neat sketch, explain the principle and operation of a DC generator.	8	L2	CO3
	b.	Derive the EMF equation of DC generator.	6	L3	CO3
	c.	Calculate the emf generated by a 6 pole DC generator having 480 conducters and driven at a speed of 1200 rpm. The flux/pole is 0.012 wb. Assume the generator to be i) Lap wound ii) Wave wound.	6	L3	CO3
		OR			
Q.6	a.	Define back emf and explain its significance.	6	L2	CO3
	b.	Derive expression for torque developed in a DC motor.	6	L2	CO3
	c.	Explain speed control of DC motor by i) Armature voltage control method ii) Flux control method.	8	L2	CO3
		Module – 4			
Q.7	a.	Derive EMF equation of 1ϕ transformer.	6	L3	CO4
	b.	List the various losses occurring in a transformer, explain how copper loss varies with road.	8	L2	CO4
	c.	500 KVA, 1ϕ transformer has R_1 = 0.4 Ω, R_2 = 0.001 Ω, V_1 = 6600 V, V_2 = 400 V, Iron loss = 3 kW, full load copper loss = 3.858 kW. Determine: i) Efficiency at full load, 0.8 pf lagging.	6	L3	CO4
		OR			
Q.8	a.	With a neat sketch, explain how rotating magnetic field is produced in a 3ϕ induction motor.	8	L2	CO4
	b.	With a neat sketch, explain squirrel cage and wound rotor of a 3ϕ induction motor.	6	L2	CO4

	c.	Define slip explain its significance.	6	L2	CO4
		Module – 5			
Q.9	a.	With neat circuit and switching table explain the 2 way and 3 way control of lamp.	8	L2	CO5
	b.	With a neat diagram, explain the working of fuse.	6	L2	CO5
	c.	What is earthing? With a neat diagram explain the pipe earthing.	6	L2	CO5
		OR			
Q.10	a.	Define tariff, explain 2 part tariff with its advantages and disadvantages.	8	L2	CO5
	b.	What is electric shock? Give the preventive measures against the shock.	6	L2	CO5
	c.	List the power rating of house hold appliances including air conditioners PC's, Laptops, printers, LED bulbs etc. Find the total load installed in a house.	6	L2	CO5

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