CONTINUOUS INTERNAL EVALUATION- 2

Dept: EC	Sem / Div: D E F	Course: Basic Electrical Engineering	Course Code: 18ELE23
Date:31-08-2021	Time: 3:00-4:30 PM	Max Marks: 50	Elective: N
Note: Answer any 2 full questions, choosing one full question from each part.			

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QN		Questions	Marks	RBT	COs
		PART A			
1	a	Derive the condition for which the efficiency of a transformer is maximum.	7	L2	CO2
	b	Derive the EMF equation of synchronous generator.	8	L2	CO3
	c	For a single phase, 50Hz, 150kVA transformer, the required no-load voltage ratio is 5000V/250V. Find (a) the number of turns in each winding for a maximum core flux of 0.06Wb, (b) the efficiency at half rated kVA, and UPF, (c) the efficiency at full load, 0.8 pf lagging, and (d) the kVA load for maximum efficiency, if the full load copper losses are 1800W and core losses are 1500W.	10	L3	CO2
		OR			
2	a	Describe the constructional features of synchronous generator with suitable diagram.	10	L2	CO3
	b	Define slip of an induction motor and derive expression for frequency of rotor current.	6	L2	CO2
	c	In a 50kVA, 11kVA/400V, single phase transformer, the iron and copper losses are 500W and 600W, respectively. Calculate (a) the efficiency at UPF at full load, (b) the load for maximum efficiency, and (c) the iron and copper losses for this load.	9	L3	CO2
		PART B			
3	a	What are the various loses that occur in a transformer? Give the equations for these loses?	7	L1	CO2
	b	Explain clearly the working principle of a three phase induction motor.	6	L2	CO2
	c	A 10 pole induction motor is supplied by a 6 pole alternator which is driven by a prime mover at 1200 rpm. If the motor runs at slip of 3% what is its speed?	6	L3	CO2, CO3
	d	A 3 phase, 50Hz synchronous generator runs at speed of 166.67 rpm. How many poles does it have?	6	L3	CO3
		OR			
4	a	Derive EMF equation of a transformer.	6	L2	CO2
	b	Explain the concept of rotating magnetic field in case of a 3 phase induction motor.	6	L2	CO2
	c	A 4-pole, 3 phase, 50Hz, star connected alternator has a single layer winding in 36 slots with 30 conductors per slot. The flux per pole is 0.05Wb and the winding is full pitched. Find the synchronous speed and the line voltage.	8	L3	CO3
	d	6 pole induction motor is fed from 50Hz supply. If the frequency of rotor emf at full load is 2Hz, find the full load slip and speed.	5	L3	CO2

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