

CRM08

Rev 1.11

EC

01/04/22

**CONTINUOUS INTERNAL EVALUATION - 3**

Dept:EC	Sem / Div:I ABC	Sub:Basic Electrical Engineering	S Code:21ELE13
Date:07/04/22	Time:3:00-4:30	Max Marks: 40	Elective: N

Note: Answer any 2 full questions, choosing one full question from each part.

QN	Questions	Marks	RBT	CO's
<b>PART A</b>				
1	a Explain the basic working principle of d.c generator with suitable diagrams.	6	L2	CO2
	b A 4 pole, 3-phase induction motor operates from a supply whose frequency is 50 Hz. Calculate (i) Synchronous speed (ii) The speed of the rotor when the slip is 0.04 (iii) The frequency of the rotor current when the slip is 0.03 (iv) The frequency of the rotor current at standstill.	7	L3	CO3
	c A 4 pole, 230V, DC series motor, wave connected armature with 1254 conductor, with flux per pole of 22mWb, takes 50A for motoring. The Armature and series field coil resistance are 0.3Ω and 0.2Ω respective. Calculate the speed and torque developed in watts.	7	L3	CO2
<b>OR</b>				
2	a Derive the EMF equation of a DC generator.	6	L2	CO2
	b Explain the two types of rotors of an induction motor.	7	L2	CO3
	c A 8 pole, DC shunt generator With lap connected armature has field and armature resistance of 50Ω and 0.1Ω respectively, if the generator supplies forty, 120V, 40W lamps, calculate the total armature current, the current in each armature conductor and the generated	7	L3	CO2

EMF. Take 1V per brush as contact drop.

**PART B**

3 a	With neat sketches explain, the construction of two types of synchronous generator.	6	L2	CO3
b	Derive the condition for which the efficiency of a transformer is maximum.	7	L2	CO2
c	A 10KVA transformer has iron loss of 450W and full load copper loss of 650W. If the power factor of the load is 0.8 lagging. Calculate: i) Full load efficiency ii) Load at maximum efficiency iii) Maximum efficiency at unity power factor.	7	L3	CO2

**OR**

4 a	Explain, the concept of rotating magnetic field in case of a 3 phase induction motor	6	L2	CO3
b	A 16 pole, 3 phase star connected alternator with 144 slots and 10 conductor per slot. The flux per pole being 30mWb sinusoidally distributed. Find the phase and line voltages if the speed is 375 r.p.m.	7	L3	CO3
c	Show that the armature torque is proportional to armature current in d.c motor.	7	L2	CO2

$E_{ph} = 4.44$

~~180~~

Prepared by: Nisha G R

8 Kant  
HOD

$T_a \propto I_a$