Q.P. Code: 18EE0204 **R18**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations December-2021

ELECTRICAL MACHINES-I

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 60

PART-A

(Answer all the Questions **5 x 2 = 10** Marks)

1	a	Why DC Series Generator is not operated on No load?	L1	2M
	b	What is counter EMF?	L2	2M
	c	Name the methods of direct and indirect testing.	L1	2M
	d	Write the Emf equation of a transformer and define each term	L2	2M
	e	What are the types of Stepper Motors?	L2	2M

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2	a	Explain the basic principle of operation of a DC Generator with a simple loop generator.	L1	5M
	b	List out the applications of DC Generators.	L2	5M

OR

3	a	Derive an expression for e.m.f equation of DC Generator.	L3	5M
	b	An 8-pole lap connected armature has 960 conductors, a flux of 40 m Wb per pole and a speed of 400 r.p.m. Calculate the emf generated on open circuit. If the armature were wave connected, at what speed it must be driven to generate 400 V.	L3	5M

UNIT-II

4		Draw and explain the characteristics of DC series and DC Shunt Motors.	L2	10M

OR

5		Explain the principle of operation of a D.C motor. Derive the equation for the torque developed by a D.C. motor.	L2	10M

UNIT-III

6		Describe Field's test in detail with neat diagram. What are its advantages and disadvantages?	L2	10M

OR

7		Explain in detail about the parallel operation of DC series generators.	L2	10M

UNIT-IV

8	a	Draw the Expression for Voltage regulation of a transformer form the simplified approximate equivalent circuits of 1-Φ transformer and obtain condition for zero regulaton.	L3	6M
	b	A 10KVA, 2000/400V single-phase transformer has the following data: R1=5Ω, X1=12Ω, R2=0.2 Ω, X2=0.48 Ω. Determine the secondary terminal voltage at full load, 0.8 power factor lagging when the Primary supply voltage is 2000V.	L3	4M

OR

9	a	Describe the Parallel operation of transformers with equal voltage ratios.	L2	5M
	b	Draw the equivalent circuit of an Autotransformer.	L3	5M

UNIT-V

10	a	Explain the double revolving field theory and draw the torque speed characteristics.	L2	5M
	b	1-Ø Induction Motor is 4 pole, Output= 410w, Supply voltage=230V, frequency =50Hz, input current =3.2A, power factor=0.7, Speed = 1410 rpm, Calculate i) The efficiency ii) The slip of the motor when delivering rated output.	L3	5M

OR

11		Explain working principle of a Shaded Pole Motor .discuss about its torque-speed characteristics.	L2	10M

END