Q.P. Code: 16EE212 **R16**

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations March-2021

ELECTRICAL TECHNOLOGY

(Electronics and Communication Engineering)

Time: 3 hours Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1		Explain with a neat sketch the Working principle of operation of D.C generator.	**12M**
		OR	
2		Draw and explain magnetization and load characteristics of DC shunt generator.	**12M**

UNIT-II

3	a	Deduce an expression for torque developed in the armature of DC motor.	**6M**
	b	A 120V DC shunt motor has armature and shunt field resistances of 0.2Ω and 60Ω it runs at 1800 rpm when it takes full load current of 40A. Find the speed of motor while it is operating at half full load, terminal voltage remaining the same.	**6M**
		OR	
4		What are the different losses in a DC machine? Which of them are variable losses? Derive the condition for maximum efficiency of a DC machine	**12M**

UNIT-III

5	a	Explain the working principle of operation of single – phase transformer.	**6M**
	b	A 3000/200V, 50Hz single phase transformer is built on a core having an effective cross sectional area of 150 sq.cm and have 80 turns in low voltage winding. Calculate (i) the Value of maximum flux density (ii) the No. of turns in HV winding.	**6M**
		OR	
6	a	Derive the EMF equation of a single-phase transformer.	**5M**
	b	A 2200/250V transformer takes 0.5A and power factor of 0.3 on open circuit. Find the Magnetizing and working components of no load primary current. Also draw no load phasor diagram.	**7M**

UNIT-IV

7	a	Explain the principle of operation of Induction motor.	**8M**
	b	Explain why the rotor of 3-phase induction motor can never attain synchronous speed.	**4M**
		OR	
8	a	Derive condition for maximum torque under running condition.	**6M**
	b	A 3-phase induction motor is wound for 4 poles and is supplied from 50 Hz system. Calculate: (i) The synchronous speed (ii) The speed of the motor when slip is 4% (iii) The rotor current frequency when the motor runs at 600 rpm.	**6M**

UNIT-V

9		Explain the Synchronous impedance method for calculating the regulation of a three phase alternator	**12M**
		OR	
10	a	Explain the theory of operation of a synchronous motor.	**6M**
	b	A 550 V, 50 KVA single phase alternator has an effective resistance of 0.2Ω. A field Current of 10A produces an armature current of short circuit and an emf of 450 V of open circuit. Calculate i) Synchronous impedance and reactance ii) The full load regulation when the power factor is 0.8 lagging.	**6M**

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