Code No: RT31024 **R13** SET - 1

III B. Tech I Semester Supplementary Examinations, October/November -2018

ELECTRICAL MACHINES – III

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1	a)	Explain why single-phase induction motors do not have self – starting torque.	[4M]
	b)	Explain the constructional aspect of the Synchronous generator.	[4M]
	c)	Explain the effects of armature reaction and how can it be compensated.	[4M]
	d)	Explain the term Voltage regulation and give its significance.	[4M]
	e)	Explain why synchronous motor does not have starting torque.	[3M]
	f)	Explain the effect of change of load on a synchronous motor.	[3M]

PART -B

2	a)	Explain the different methods of speed control of a single phase induction motor?	[8M]
	b)	Draw and explain the torque – slip characteristic of a single – phase induction motor on the basis of Double – revolving field theory.	[8M]
3	a)	Explain the principle of operation of a synchronous generator.	[8M]
	b)	A 4-pole, 50 Hz star connected alternator has 6 slots per pole per phase and a two layer winding with 4 conductors per slot. If the coil span is 150^0, find the no –load terminal emf if the flux per pole is 300 mWb.	[8M]
4	a)	Explain the salient features of Salient pole rotor type synchronous machine in detail.	[8M]
	b)	In a 1500 KVA, 3300 V, 50 Hz, three – phase , star – connected synchronous generator, a field current of 50 A produces a short- circuit current of 250 A and open – circuit voltage of 1100 V line to line. Determine the voltage regulation at full load and at 0.8 power factor lagging. Consider the armature resistance to be 0.3 ohms.	[8M]
5	a)	What is synchronizing Power? Derive equations for synchronizing power of cylindrical rotor and salient pole alternators.	[8M]
	b)	A 5 KVA, 3 – phase, 220 V, three – phase star connected synchronous generator has $X_d = 5$ ohms and $X_q = 2$ ohms. If the generator delivers full load current at 0.8 power factor lagging and at rated voltage, determine the load angle and maximum power output of the generator.	[8M]
6	a)	Draw and explain the equivalent circuit and phasor diagram of a synchronous motor.	[8M]
	b)	Explain the power angle characteristics of a salient pole synchronous motor.	[8M]
7		Write short notes on the following: i)V curves in synchronous motor and their significance ii) synchronous induction motor	[16M]

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