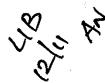
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Question Paper Code: 91494

## B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019 Fifth Semester

Electrical and Electronics Engineering EE 6504 – ELECTRICAL MACHINES – II (Regulations 2013)

Time: Three Hours Maximum: 100 Marks

Answer ALL questions

PART - A

 $(10\times2=20 \text{ Marks})$ 

- 1. What is meant by armature reaction in alternator?
- 2. Which method of predetermining the voltage regulation is called optimistic method?

  Why?
- 3. Why a 3-phase synchronous motor will always run at synchronous speed?
- 4. What is meant by 'constant power circle' for synchronous motor?
- 5. What is synchronous induction motor?
- 6. Define pullout torque.
- 7. Why is a starter needed for starting a large capacity induction motor?
- 8. Define slip power.
- 9. State double field revolving theory.
- 10. Identify the category of motor used in ceiling fan.

			PART – B (5×13=65 Ma	rks)
11.	a)		xplain the operating principle of three-phase alternator and derive the emf	) (13)
			(OR)	
	b)	i)	Explain how the voltage regulation is predetermined using ZPF method.	(7)
		ii)	Describe about slip test.	(6)
12.	a)	i)	Explain V curve and inverted V curve.	(4)
oly e		ii)	Explain different starting methods of synchronous motor. (OR)	(9)
	b)	i)	A 1000 kVA, 11000 V, 3-phase star-connected synchronous motor has an armature resistance and reactance per phase of 3.5 $\Omega$ and 40 $\Omega$ respectively. Determine the induced emf and angular retardation of the rotor when fully	( )
H2 <sup>1</sup>	1 (3) 1	A.M.	loaded at 0.8 p.f. lagging and 0.8 p.f. leading.	(6)
		ii)	Derive the expression for power delivered by a synchronous motor in terms of load angle $(\alpha)$ .	(7)
13.	a)	i)	Derive the expression for developed torque in a 3-phase induction motor and find the condition for maximum torque.	(8)
		ii)	Explain construction and working of double cage induction motor.	(5)
			(OR)	
	b)	i)	Develop the equivalent circuit of a 3-phase induction motor.	(8)
	Í	ii)	A 440 V, 3-phase, 50 Hz, 6-pole induction motor running at 960 rpm takes 50 kW at a certain load. The friction and windgage loss is 1.8 kW. The stator losses are 1.2 kW. Calculate the	( )
•			1) The rotor copper loss,	
			2) The output from the rotor and	4-14
			3) Efficiency of the motor.	(5)
14.	a)	E		(13)
		_	(OR)	
	b)		xplain the speed control of 3 phase induction motor with slip power recovery heme.	(13)

15. a)	i)	Explain the operation of a single phase induction motor using double field revolving theory.	(7)
	ii)	Discuss with neat diagram the operation of shaded pole IM.	(6)
		(OR)	
b)	E	xplain the construction and working principle of	•
·		A.C. Series motor	(6)
	ii)	Hysteresis motor.	(7)
		PART – C (1×15=15 Mar	ks)
	fo it	(OR)	(15)
<b>b</b> )		Construct the phasor diagram of non-salient pole synchronous generator connected to infinite bus.	(8)
	ii)	Discuss the construction and working of Repulsion motor.	(7)