Register Number: ……..

B.E DEGREE EXAMINATIONS: MAY/JUNE 2013

Fourth Semester

ELECTRICAL AND ELECTRONCS ENGINEERING

EEE105**:** Electrical Machines II

(Graph sheets are to be provided)

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Armature reaction in alternator primarily effects
   a) Rotor speed b) Terminal Voltage
   c) frequency d) generated voltage
2. At lagging loads, armature reaction in an alternator is
   a) Cross magnetizing b) Demagnetizing
   c) Not effective d) Magnetizing
3. If the field of synchronous motor is under exited, the power factor will be
   a) Lagging b) Leading
   c) Unity d) More than unity
4. The maximum value of torque angle in synchronous motor is _____ degrees
   a) 45 b) 90
   c) 60 d) 30
5. In an induction motor as the rotor resistance increases, the starting torque
   a) Remains constant b) Increases
   c) Decreases d) None of the above
6. In an induction motor under no load test _____ losses are measured
   a) Iron b) Mechanical
   c) Iron and mechanical d) copper
7. The starting winding of 1-phase induction motor is placed in
   a) Rotor b) Stator
   c) Armature d) Field
8. The capacitor in capacitor start induction motor is connected in series with _____winding
   a) Starting b) Running
   c) Squirrel cage d) Compensating
9. In slip power recovery when electric power is supplied to rotor, it runs at _____speed
   a) Constant b) Super synchronous

c) Sub Synchronous d) synchronous

10. In induction motor when voltage is varied proportional to frequency, _____ is constant

a) speed b) Air gap flux

c) Current d) Power

PART B (10 x 2 = 20 Marks)

11. Distinguish between stationary field and rotating field alternators
12. What are the conditions to be satisfied for synchronizing of alternators?
13. Why synchronous motor is not a self starting motor?
14. Define pull out torque in synchronous motor
15. What is the condition at which the torque developed in 3-phase induction motor is Maximum?
16. Why slots on three phase induction motor are skewed?
17. What is cogging in induction motors and how it can be overcome?
18. Why is starter necessary to start 3 phase induction motor?
19. What is a universal motor?
20. Compare the performance of split phase and capacitor start Induction motor

PART C (5 x 14 = 70 Marks)

21. a) (i) Define armature reaction and explain the effect of armature reaction on different power factor loads of synchronous generators (7)

(ii) Explain two reaction theory of salient pole synchronous machines (7)

(OR)

b) (i) Explain the synchronizing of alternators by dark lamp method (4)

(ii) A 3 phase, 6000V,star connected alternator has the following OCC at rated speed (10)

I_F	14	18	23	30	43
V	4000	5000	6000	7000	8000

With the armature short circuited and full load current flowing the field current is 17 A. When the machine is supplying a full load of 2 MVA at zero power factor , the field current is 42.5 A and the terminal voltage is 6000 V. find the field current required when the machine is supplying full load at 0.8 pf lagging

22. a) (i) Discuss briefly why synchronous motors are not self starting. Explain any two methods of starting of synchronous motors. (10)

(ii) Draw the phasor diagram of synchronous motor when it takes power at lagging power factor (4)

(OR)

b) (i) Derive an expression for power delivered by a synchronous motor in terms of load angle (7)

		(ii)	Explain the significance of V and inverted V curves	(7)
23.	a)	(i)	Explain the torque slip characteristics of 3 phase induction motor with necessary equations	(7)
		(ii)	Draw and explain the equivalent circuit of 3 phase induction motor	(7)
			(OR)	
	b)	(i)	A 4- pole,50 Hz,415 V, 37 KW,delta connected 3 phase induction motor gave the following results No Load test : 415 V, 16 A ,1.75 KW Blocked Rotor Test : 100 V, 55 A, 2.85 KW. Stator resistance per phase =0.45 Ω.Draw the circle diagram and find the full load performance	(10)
		(ii)	Write a short notes on double cage induction motor	(4)
24.	a)		Explain with neat sketches the working of following starters (i) Star Delta Starter	(7)
			(ii) Rotor resistance starter	(7)
			(OR)	
	b)	(i)	Explain with neat diagram the static scherbius drive system of slip power recovery scheme	(7)
		(ii)	Write short note on induction generator	(7)
25.	a)	(i)	Using Double revolving field theory explain why a 1 phase induction motor is not self starting	(10)
		(ii)	Write short notes on stepper motor	(4)
			(OR)	
	b)		Explain the construction, working characteristics and applications of reluctance motor and hysterisis motor	

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