- (c) A 3 phase induction motor has a staring torque of 100% and a max torque of 200% of the full load torque determine:
 - (i) Slip at which maximum torque occurs
 - (ii) Full load slip
 - (iii) Rotor current at starting in per unit of full load rotor current.

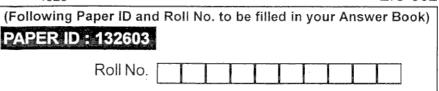
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Printed Pages: 4



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EIC-602



B.Tech. (Sem.VI) Even Semester

SPL. THEORY EXAMINATION, 2014-15

ELECTRICAL MACHINES

Time: 2 Hours]

[Total Marks: 50

Note: Attempt all questions. All questions carry equal marks.

1. Attempt any two parts of the following:

7x2=14

- (a) From the construction point of view, enumerate the common essential features of rotating electrical machine. Give also the basic characteristics of rotating electrical machine.
- (b) A 3-phase pole, star connected synchronous generator revolves at 1000 rpm. The stator has 90 slots and 8 conductors per slot. The flux per pole is 0.05 Wb. Calculate the voltage generated, if the winding factor is 0.96.

- (c) Draw the speed torque characteristics, giving examples with justification, of the following types of loads:
 - (i) Constant Power
 - (ii) Torque directly proportional to speed
- 2. Attempt any two parts of the following: 6x2=12
 - (a) Discuss the magneto motive force method of determining the voltage regulation of an alternator.
 - (b) Explain the process of commutation in a dc machine and describe the methods to improve it. A dc shunt machine; connected to 250V supply has an armature resistance (including brushes) of 0.12_{Ω} and the resistance of the field circuit is 100_{Ω} . Find the ratio of the speed as a generator to the speed as a motor, the line current in each case being 80A.
 - (c) Describe the working principle of (a) split phase (b) Capacitor - start single phase induction motor with the help of neat sketch.

- 3. Attempt any two parts of the following:
 - (a) Define armature reaction. How it affects the main field under unity, 90 lagging and 90 leading power factor conditions. Explain with the help of suitable diagram.

6x2=12

- (b) Explain the hunting in a synchronous machine. Discuss causes of hunting. What the purpose of damper winding in synchronous machine?
- (c) A 3 phase synchronous motor of 8000 W at 1100 V has synchronous reactance of 8_Ω per phase. Find the minimum current and the corresponding induced emf for full load condition. The efficiency of the machine is 0.8 neglect armature resistance.
- 4. Attempt any two parts of the following: 6x2=12
 - (a) Using double revolving field theory, explain why a single phase induction motors is not self starting.
 - (b) Describe with construction diagram the working of the following starters:
 - (i) Direct on-line starter
 - (ii) Auto transfer starter
 - (iii) Star delta starter