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**EX-503 (GS)****B.E. V Semester**

Examination, December 2017

**Grading System (GS)****Electrical Machine - II***Time : Three Hours**Maximum Marks : 70**Note:* i) Attempt any five questions.

ii) All questions carry equal marks.

1. a) What is armature reaction? Explain its effects and methods of limiting it. Also define commutation. 7
- b) A 220V dc series motor is running at a speed of 800 rpm and draws 100 amp. Calculate at what speed the motor will run when developing half the torque. Total resistance of the armature and field is 0.1 ohm. Assume that magnetic circuit is unsaturated. 7
2. a) What is the necessity of starter for a dc motor? Explain the starting of dc motor with four points starter with neat sketch. Compare it with three point starter. 7
- b) Explain speed control of dc motor by field weakening and armature rheostatic control method with circuit diagram. 7
3. a) Explain Swinburne's test with circuit diagram for finding efficiency of dc machine. Compare it with Hopkinson's test. 7
- b) A lap wound dc shunt generator having 80 slots with 10 conductors per slot generates an emf of 400V at no load, when running at 1000 rpm. At what speed should it be rotated to generate a voltage of 220V on open circuit. 7

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4. a) The stator of a 3 phase, 16 pole alternator has 144 slots and there are 4 conductors per slot connected in two layers and the conductors of each phase are connected in series. If the speed of the alternator is 375 rpm. 7  
Calculate emf induced per phase. The resultant flux in the air gap is 0.05 weber per pole sinusoidally distributed. Assume the coil span as 150° electrical.
- b) Explain ZPF method to determine the voltage regulation of alternator with diagram. 7
5. a) Explain the determination of negative sequence reactance and zero sequence reactance of synchronous machine. 7
- b) Explain hunting phenomenon and its bad effects? How it can be controlled? Explain. 7
6. a) Explain power angle characteristics and obtain power equation for cylindrical rotor alternator connected to infinite bus. 7
- b) Draw and explain the "V" curves at no load to verify load conditions. 7
7. a) Give various starting methods of synchronous motor with diagram and explain them in brief. 7
- b) Explain three phase short circuit oscillogram and discuss how transient parameters can be determined from such oscillogram. 7
8. Explain the following : (any two) 14
  - a) Hysteresis motor
  - b) Stepper motor
  - c) Metadyne and Amplidyne.

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