Roll No ....

EE - 501
B.E. V Semester
Examination, June 2016
Electrical Machine - II

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each question are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I
1. a) State the condition necessary for paralleling alternators.
   b) Why bright lamp of synchronizing is preferred over dark lamp method?
   c) Explain how open-circuit and short-circuit test are conducted on a synchronous machine.
   d) Explain why synchronous - impedance method of computing the voltage regulation leads to pessimistic value at lagging power factor load.

OR

Explain the different methods of excitation system of alternators.

Unit - II
2. a) Explain v curves as applied to synchronous motor.
   b) Explain armature reaction in synchronous motors.
   c) Write the merits and demerits of synchronous motors.
   d) What is a synchronous condenser? Show the region of operation of the condenser on V curves. Where are synchronous condenser used?

OR

Explain what happen when the excitation of a synchronous motor connected to an infinite bus is varied the load torque remaining constant.

Unit - III
3. a) Distinguish between transient and sub-transient reactance.
   b) Explain Transient Reactances.
   c) Analyse the operation of synchronous machine under sudden short circuit.
   d) Describe the physical concepts of various synchronous machine reactance in detail.

OR

A synchronous motor, fed from 50Hz supply, is mechanical coupled with an alternator. If this alternator is required to generator a voltage of 50Hz, calculate the minimum number of poles that the motor-generator set must have.

Unit - IV
4. a) With the help of a suitable diagram, describe the common essential feature of rotating electrical machine.
   b) Explain the basic reason of using transformation in electrical machines.
   c) What are the advantage of having power in variable during the transformation.
   d) Deduce Park's transformation relating the 3 phase current of a synchronous machine to its corresponding d-q axes currents and its inverse.

OR

Describe the Kron's primitive machine in detail. Derive the voltage equation of this machine in the matrix form.

Unit - V
5. a) Describe the switched reluctance motor in detail.
   b) Compare a variable reluctance stepper motor with switched reluctance motor.
   c) Discuss importance of linear transformation in electrical machines.
   d) Explain the steady state operating characteristics of a salient pole machine and derived expressions of power.

OR

Describe the construction, working and field of a application of any two of the following:

i) Switched reluctance motor

ii) Pm Brushless d.c motor

iii) Metadyne transformer.