MODEL QUESTION PAPER

SM. 1

TED (15)-6033

Reg.No......

(REVISION-2015)

Signature.......

SIXTH SEMESTER DIPLOMA EXAMINATION IN ELECTRICAL AND ELECTRONICS ENGINEERING

SYNCHRONOUS MACHINES AND F.H.P MOTORS

[Time: 3hrs

(Maximum marks: 100)

Marks

PART-A

(Maximum marks: 10)

I. Answer the following questions in one or two sentences. Each question carries 2 marks.

1. Write the EMF equation of alternator

2. Name the tests to be conducted for calculating voltage regulation of an alternator

3. What is V curve?

4. What do you meant by universal motor?

5. List the applications of shaded pole motor

(5*2=10)

PART-B

(Maximum: 30)

II. Answer *any five* of the following questions. Each question carries 6 marks

1. Derive the distribution factor of an alternator

2. Draw the vector diagram of loaded alternator under lagging and leading power factor Draw the vector diagram of loaded alternator under lagging and leading power factor

3. Explain the regulation by Ampere turn method

4. List the methods to find regulation of alternator

5. Describe classification of single phase induction motors

6. Explain the principle of working of synchronous motors

7. Explain the working of shaded pole motor

(5*6=30)

Marks

PART-C

(Maximum marks: 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

UNIT-1

III. (a). Compare alternators based on the construction of rotors.

(b).A three phase, 4 poles, 48 slots alternator has single layer winding with full pitch coils and 15 turns per pole. Calculate the EMF per phase if flux per pole is 0.03 wb and speed 1500 rpm. Assume sinusoidal distribution.

OR

IV. (a) For a three phase winding with 4 slots per pole per phase and with the coil span of 10 slots evaluate the distribution and pitch factors

(b) Explain the advantages for providing rotating field system for an alternator

UNIT-II

V.   (a) A 200KVA 3000V 50 Hz three phase star connected alternator has effective armature resistance of 0.6ohm,a field current of 45A produces a short circuit current of 240A and open circuit EMF of 1040 V (between lines).Calculate the percentage regulation at full load 0.8pf leading

   (b) Explain the method to find out voltage regulation by mmf method

OR

VI.   (a) Determine the voltage regulation of a 2000V single phase alternator giving a current of 100A at 0.8pf lead from the test results. Full load current 100A is produced on short circuit by a field current of 2.5 A. An EMF of 500V is produced on open circuit by the same excitation. The armature resistance is 0.8ohm.

   (b) Explain the procedural steps to determine the voltage regulation by ZPF method

UNIT-III

VII. (a) Explain the power flow of synchronous motor

   (b) Explain the starting methods of synchronous motors

OR

VIII. (a) Explain why single phase induction motors are not self starting

   (b) Describe the procedure for plotting V curve

UNIT-IV

IX   (a) Describe permanent capacitor single phase induction motor

   (b) Explain the working of AC series motor

OR

X   (a) Explain the construction and working of capacitor start induction run motors

   (b) Explain the working of repulsion motor