

Scheme - I

Sample Question Paper

Program Name : Diploma in Industrial Electronics
Program Code : IE
Semester : Fourth
Course Title : Electrical Machines and Transformers
Max. Marks : 70

22431

Time : 3 Hrs.

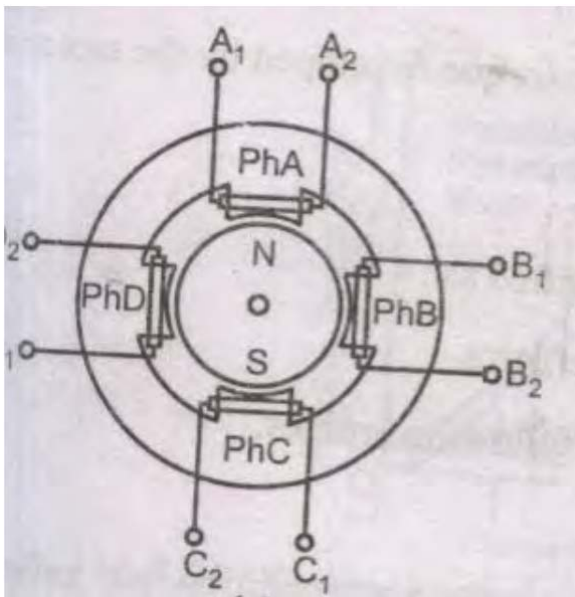
Instructions:

1. All questions are compulsory.
2. Figures on the right indicate maximum marks.
3. Assume any suitable data if necessary.
4. Illustrate answers with suitable sketches wherever necessary.
5. Preferably write the answers in sequential order.

Q1. ATTEMPT ANY FIVE OF THE FOLLOWING.

10 Marks

- a) State the types of braking used in electrical machines.
- b) Name the various parts of an Induction motor.
- c) Give any two applications of AC servomotors.
- d) State any four conditions necessary for connecting alternators in parallel.
- e) Name the different methods of synchronizing the alternators.
- f) Identify the type of stepper motor and name its parts.



- g) Write any two electrical insulation classes along with their temperature limit.

Q2. ATTEMPT ANY THREE OF THE FOLLOWING.

12 Marks

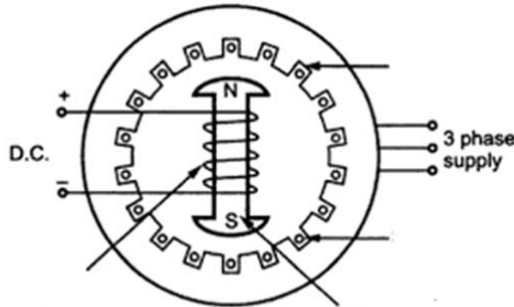
- a) Explain with circuit diagram the procedure to conduct brake test on a dc shunt motor.
- b) Name any four parts of 3 phase Induction motor. Also state their functions.

- c) Explain with neat sketch the working principle of the synchronous motor.
- d) Describe with neat sketch, the construction of variable reluctance stepper motor.

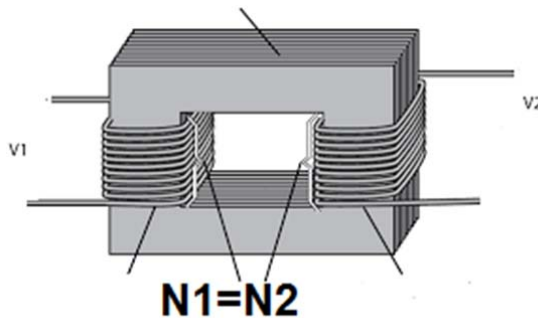
Q3. ATTEMPT ANY THREE OF THE FOLLOWING.

12 Marks

- a) Explain the working principle of 3 phase Induction motor with neat sketch.
- b) Identify the motor, and label its parts.



- c) Explain the procedure to find voltage regulation of a 3 phase Alternator for a leading p.f. load, by direct loading method.
- d) Explain with a neat sketch, the working principle of a brushless DC motor.
- e) Identify the type of transformer, also name its parts. Also give its applications.



Q4. ATTEMPT ANY THREE OF THE FOLLOWING.

12 Marks

- a) Name the type of dc motor used in steel rolling mills. Justify your answer.
- b) Explain torque slip characteristics of 3 phase Induction motor.
- c) Explain the role of damper winding in synchronous motor.
- d) Explain the procedure to carry out polarity test on single phase transformer.

Q5. ATTEMPT ANY TWO OF THE FOLLOWING.

12 Marks

- a) Suggest the suitable starter for the following motors with justification.
 1. 10 HP, 415V, 50Hz, 3 phase, squirrel cage Induction motor
 2. 5HP, 415V, 50Hz, 3 phase, slip ring Induction motor
 3. 2.2 KW, 415V, 50Hz, 3 phase, squirrel cage Induction motor.
- b) Suggest a suitable motor for rotary positioning. Justify your answer. Also give the typical Name plate details of that motor.
- c) Briefly explain the effect of changing excitation in synchronous motors with constant load.

Q6. ATTEMPT ANY TWO OF THE FOLLOWING.

12 Marks

- a) Explain with sketches the speed control of 3 phase induction motor by i) stator voltage control ii) frequency control iii) rotor resistance control methods.
- b) A 3 phase star connected Alternator is rated at 1500 kVA, 13.5 kV. The armature resistance and synchronous reactance are 1.4 ohms and 25 ohms respectively per phase. Calculate percentage voltage regulation for a load of 1200 kW at 0.8 leading p.f.
- c) A 10 KVA, single phase, 50 Hz, 500/250V transformer has the following results.
O.C. Test (L.V. Side): 250V, 3A, 200W
S.C. Test (H. V. Side): 15V, 20A, 300W .Calculate efficiency and regulation at full load 0.8 P.F. lagging.

Scheme - I

Sample Test Paper - I

Program Name : Diploma in Industrial Electronics
Program Code : IE
Semester : Fourth
Course Title : Electrical Machines and Transformers
Max. Marks : 20

22431

Time : 1 Hour

Instructions:

1. All questions are compulsory.
2. Figures on the right indicate maximum marks.
3. Assume any suitable data if necessary.
4. Illustrate answers with suitable sketches wherever necessary.
5. Preferably write the answers in sequential order.

Q1. ATTEMPT ANY FOUR OF THE FOLLOWING.**08 Marks**

- a) Draw the speed torque characteristics of dc series motor. Also write the expression for relation between speed and torque.
- b) Give any two applications of dc shunt motor.
- c) Explain the necessity of starters for 3 phase Induction motors.
- d) Draw the torque- speed characteristics of 3 phase Induction motors.
- e) Define slip of a 3 phase Induction motor. Also write the value of slip at starting of 3 phase Induction motor.
- f) Name different parts of a 3 phase Alternator.

Q2. ATTEMPT ANY THREE OF THE FOLLOWING.**12 Marks**

- a) Explain with circuit diagram the procedure to control the speed of dc shunt motor by varying armature voltage.
- b) Name any four troubles that can occur in 3 phase Induction motor. Also suggest rectification for the same.
- c) Describe the construction of 3 phase slip ring induction motor with neat sketch.
- d) Write the EMF equation of 3 phase Alternator. Explain the meaning of each term used in it.
- e) Explain the construction of 1 phase Alternator.

Scheme - I

Sample Test Paper - II

Program Name : Diploma in Industrial Electronics
Program Code : IE
Semester : Fourth
Course Title : Electrical Machines and Transformers
Max. Marks : 20

22431

Time : 1 Hour

Instructions:

1. All questions are compulsory.
2. Figures on the right indicate maximum marks.
3. Assume any suitable data if necessary.
4. Illustrate answers with suitable sketches wherever necessary.
5. Preferably write the answers in sequential order.

Q1. ATTEMPT ANY FOUR OF THE FOLLOWING**08 Marks**

- a) List any two applications of synchronous motor.
- b) Write the significance of inverted V characteristics of synchronous motor.
- c) List the different braking methods of synchronous motors.
- d) Name any four special transformers.
- e) Name any four special motors.

Q2. ATTEMPT ANY THREE OF THE FOLLOWING**12 Marks**

- a) Explain with neat sketch the working principle of a synchronous motor.
- b) Draw and explain V- curve for a synchronous motor.
- c) Explain the working principle of AC servomotor with neat sketch.
- d) List the applications of radio frequency transformer.
- e) Explain with circuit diagram the direct loading test on single phase transformer.