No. of Printed Pages : 3

BEE-031

DIPLOMA IN MECHANICAL ENGINEERING (DME)

Term-End Examination

00267

December, 2017

BEE-031 : ELECTRICAL TECHNOLOGY

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt **four** questions in all. Question no. **1** is **compulsory**. Use of calculator is allowed.*

1. State *true* or *false* for the following statements : *10×1=10*

(a) Form factor is the ratio of average value to RMS value.

(b) The output and input relations of linear elements always follow superposition and homogeneity.

(c) Efficiency of maximum power transfer theorem is more than 50%.

(d) Due to cross-magnetizing effect, DC machines have poor commutation.

(e) In any motor, mechanical power developed in the armature is maximum when back emf is half of the applied voltage.

(f) By performing the open circuit test, copper loss is calculated in a transformer.

(g) The speed of a three-phase induction motor is directly proportional to the number of poles.

(h) A synchronous machine can be used as generator as well as motor without change in construction.

(i) A DC series motor has very high starting torque.

(j) Buchholz relay is placed between the main tank and conservator.

2. (a) Name the different parts of a DC machine. Briefly describe the function of each part. *10*

(b) What are the advantages of a polyphase system over a single phase system ? What are the causes of low power factor ? *10*

3. (a) Derive an emf equation of a 1-ϕ transformer. Also draw the equivalent circuit of the transformer. *10*

(b) Explain the principle of operation of DC motors. What is meant by back emf ? *10*

4. (a) Explain with neat sketches, the principle of operation of a 3-phase synchronous motor. Also explain why it will not run at other than synchronous speed. *10*

(b) Draw and explain the torque – slip characteristic of a 3-phase induction motor. *10*

5. Write short notes on any ***four*** of the following : *4×5=20*

(a) Superposition Theorem

(b) Eddy Current and Hysteresis Losses

(c) V-Curves of Synchronous Motor

(d) Three-point Starter of DC Motor

(e) Autotransformer