No. of Printed Pages : 5

BEE-031

DIPLOMA IN MECHANICAL ENGINEERING (DME)

00581

Term-End Examination

December, 2015

BEE-031 : ELECTRICAL TECHNOLOGY

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt **five** questions in all, including question no. **1** which is **compulsory**.*

1. (A) Write *True* or *False* for the following statements : *7×1=7*

(a) An overexcited synchronous motor operates at only leading power factor.

(b) The tendency to hunt can be generally minimized by the addition of mechanical flywheel.

(c) The operation of paralleling two alternators is known as synchronization.

(d) Autotransformer starters have greater efficiency.

(e) By performing short circuit test practically, we can find copper losses in a transformer.

(f) Capacitors are bilateral elements.

(g) Superposition theorem is applicable for linear elements.

(B) Select the correct answer from the given options. $7 \times 1 = 7$

(a) Internal resistance of an ideal current source is

(i) infinite

(ii) zero

(iii) very low

(iv) very high

(b) Increase in temperature of a conductor causes its resistance to

(i) increase

(ii) decrease

(iii) remain constant

(iv) cannot say

(c) With the frequency of 50 Hz, the highest speed of a 3-phase induction motor is

(i) 1500 rpm

(ii) 3000 rpm

(iii) 750 rpm

(iv) 4500 rpm

(d) Long distance power transmission is always performed at

(i) high voltage

(ii) low voltage

(iii) Any one of (i) and (ii)

(iv) Cannot say

(e) DC series motor can be used for applications requiring

(i) high starting torque

(ii) low starting torque

(iii) Both (i) and (ii)

(iv) Cannot say

(f) Two lamps of 60 W and 40 W are connected in series across a supply. Which lamp will glow brighter ?

(i) 40 W lamp

(ii) 60 W lamp

(iii) Both will glow equally bright

(iv) Data is insufficient

(g) To reduce weight of the copper, the stator winding is constructed with a coil width

(i) more than pole pitch

(ii) less than pole pitch

(iii) equal to pole pitch

(iv) Cannot be said

2. (a) Write a short note on starting of a synchronous motor. 7

(b) Make a comparison between an induction motor and a synchronous motor. 7

3. (a) Two alternators, operating in parallel, supply a total load of 40 kW at p.f. 0·8 kg, and the load on one machine is 20 kW at 0·9 p.f. lagging. What is the load on the other machine and at what power factor is it operating ? 7

(b) Explain the working principle of an alternator with relevant diagram. 7

4. (a) Draw and explain the working of a star delta starter. 7

(b) Explain the construction of an induction motor with relevant diagrams. 7

5. (a) Derive the emf equation of a transformer. 7

(b) State and explain Reciprocity theorem with the help of a circuit. 7

6. (a) Explain the Ward Leonard System method of speed control of d.c. motors. 7

(b) With the help of a circuit diagram, explain the working of a three-point starter. 7

7. (a) Calculate the equivalent resistance across the terminals A and B shown in Figure 1. 7

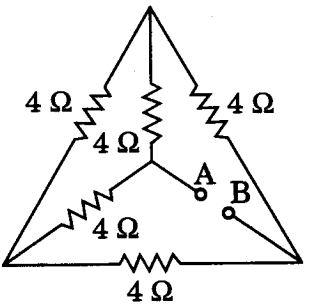

Figure 1

(b) Calculate the potential difference across the terminals A and B shown in Figure 2. 7

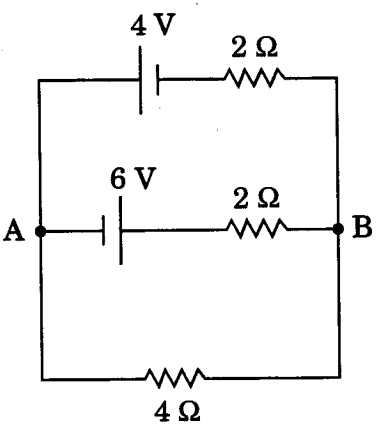

Figure 2