BEE-031

DIPLOMA IN MECHANICAL ENGINEERING (DME)

Term-End Examination

December, 2013

BEE-031 : ELECTRICAL TECHNOLOGY

Time : 2 hours *Maximum Marks : 70*

Note : *Answer* **five** *questions in all. Question no.* **1** *is* **compulsory**.

1. Write **True** or **False** for the following statements :

7x2=14

(a) Under Maximum Power Transfer condition efficiency of circuit is 50%.

(b) KVL is not applicable in AC circuits.

(c) DC series motor is most suitable for Traction purpose.

(d) Compound DC generator can be used for battery charging.

(e) Star Delta Starter has maximum starting torque.

(f) Distribution factor is always unity.

(g) In parallel resonance circuit, power factor is always unity.

2. (a) If two voltages are : 7

$V_A = 20\sqrt{2} \ \sin(\omega t + 30°)$ and

$V_B = 40\sqrt{2} \ \sin(\omega t + 90°)$

Find $V_C = V_A + V_B$.

(b) State and explain maximum power transfer theorem. 7

3. (a) Draw various characteristics of DC series motor and discuss its applications. 6

(b) The emf induced in the armature of a 45kW, 250 Volt stunt generator is 258.8 Volt. When the field current is 20 A, and armature circuit resistance is 0.005 ohm. Find : 8

(i) load current

(ii) efficiency

4. (a) What is equivalent circuit ? Draw equivalent circuit of transformer and write its significance. 7

(b) 100 kVA transformer has 2 kW Iron loss and 10 kW full load copper loss : 7

(i) Find loading at which efficiency is maximum ?

(ii) Maximum efficiency at unity pf load.

5. (a) Draw power flow diagram for 3 Phase 8
Induction Motor. Calculate rotor input
power and copper losses of rotor, if rotor
output power is 48 kW and slip is 5%.

(b) Write need of starter for 3 phase induction 6
motor and draw circuit diagram of DOL
starter.

6. (a) Derive emf equation of a synchronous 6
generator.

(b) Draw V curve for 3 phase synchronous 8
motor and write their significance.

7. Write short notes on *any two* of the following :
7x2=14
(a) Superposition Theorem

(b) Auto transformer and its applications

(c) EMF equations of DC machines

(d) Applications of Induction Motor

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