No. of Printed Pages : 2

BIEE-004

B.Tech. VIEP - ELECTRICAL ENGINEERING - III (BTELVI)

Term-End Examination

June, 2013

BIEE-004 : ELECTRICAL MACHINE - I

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt **any seven** questions.*

1. (a) Derive the e.m.f. equation of a d.c. generator. 5

   (b) Derive the torque equation of a d.c. motor. 5

2. Explain the process of commutation in a d.c. machine and describe the methods to improve it. 10

3. What is a compound generator ? Differentiate between over, level and differential compounding. Draw external characteristics for these generators. 10

4. Two 220 V DC generators operate in parallel. One machine has a terminal voltage of 260 V on no load and 220 V when supplying 30 A. The second machine has a voltage of 270 V on no - load and 220 V when supplying 45 A. Calculate : 10

(a) The output voltage
(b) Current and
(c) Output kW of each machine when total current is 65 A.

5. Explain the speed - current, torque current and speed - torque characteristic of dc series motor. **10**

6. What is an Auto transformer ? Derive an expression for saving of copper when an auto transformer is used. **10**

7. Two single - phase transformers with equal turns have impedances of $(0.6+jh)\ \Omega$ and $(0.8+j\ 10)\ \Omega$ with respect to secondary. If they operate in parallel, determine how they will share a total load of 120 kW at 0.8 power factor logging. **10**

8. Draw and explain the circuit diagram of a transformer arrangement for converting from a 3 - phase to a 2 - phase supply. **10**

9. What is an open delta system ? What are the applications of this system ? **10**

10. Write short notes on **any two** of the following : **10**
(a) In rush current in transformer
(b) Armature reaction in D.C. Machine
(c) Starting of DC motors.
