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BIEE-004

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B.Tech. VIEP - ELECTRICAL ENGINEERING - III / BTELVI

Term-End Examination

June, 2012

BIEE-004 : ELECTRICAL MACHINE - I

Time : 3 Hours *Maximum Marks : 70*

Note : Attempt ***any seven*** questions.
Ues of non-programmable scientific calculator is permitted.

1. (a) What is armature reaction ? Describe the effects of armature reaction on the operation of d.c. machines . How the armature reaction is minimized ? **2x5=10**
   (b) Define commutation. Explain the process of commutation in d.c. generators with neat sketches.

2. (a) Derive the torque equation of a d.c. motor.
   (b) Explain the principal of operation of d.c. machine. **2x5=10**

3. A 110 V d.c. shunt generator delivers a load current of 50 A. The armature resistance is 0.2 Ω, and the field circuit resistance is 55 Ω. The generator, rotating at a speed of 1800 r.p.m; has 6 poles, lap wound, and a total of 360 conductors. Calculate the no-load voltage at the armature and the flux per pole. **10**

4. A 250 V d.c. shunt motor having an armature resistance of 0.25 Ω carries an armature current of 50 A and runs at 750 r.p.m. If the flux is reduced by 10%. Find the speed. Assume that the load torque remains the same. **10**

5. Explain the speed-armature current, torque current and speed-torque characteristics of d.c. series motor. **10**

6. Explain the necessity of starter in a d.c. motor and describe a three-point-starter with a neat sketch. **10**

7. Describe Swinburne's test with the help of a neat diagram to find out the efficiency of a d.c. machine. What are main advantage and disadvantages of this test ? **10**

8. (a) Describe the various losses in a single phase transformer. **2x5=10**
   (b) What is an auto transformer ? State its merits and demerits over the two winding transformer.

9. Describe the construction, working, types, connections of three phase transformer. **10**

10. Write short notes on *any two* of the following : **2x5=10**
   (a) Speed control of d.c. motor.
   (b) Power transformer
   (c) Regenerative braking in d.c. series motor.