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BIEE-004

B.Tech. VIEP - ELECTRICAL ENGINEERING - III

00268

Term-End Examination

June, 2011

BIEE-004 : ELECTRICAL MACHINE - I

Time : 3 hours *Maximum Marks : 70*

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

1. (a) Derive emf equation of DC machine. 5
   (b) Explain the construction and working of DC machine. 5

2. A 220 V. dc series motor is running at a speed of 800 rpm and draws 100 A. Calculate at what speed the motor will run when developing half the torque. Total resistance of the armature and field is 0.1 Ω. Assume that the magnetic circuit is unsaturated. 10

3. An 8- pole generator has 500 armature conductors and has a useful flux per pole of 0.065 Wb. What will be the emf generated if it is lap connected and runs at 1000 rpm ? What must be speed at which it is to be driven to produce the same emf if it is wave wound ? 10

4. Explain speed - current, torque- current and speed- torque characteristics of dc shunt motor. 10

5. What are the drawbacks of three point starter ? Describe a four point starter with a neat sketch. 10

6. Explain briefly Hopkinson's test for determination of efficiency of dc shunt machines. What are main advantages and limitations of this test. 10

7. How many losses occur in dc machine. Explain copper and core losses of dc machine. 10

8. (a) Draw the equivalent circuit diagram of a practical transformer. 5

   (b) Explain the construction and working of single phase auto transformer. 5

9. Determine the number of turns per phase in each winding of a 2- phase transformer with a ratio of 20,000/2000 V at 50 Hz. The high voltage winding is delta connected and low voltage winding is star connected. Each core has a cross section of 500 cm^2. Assume a flux density 1.2 Wb/m^2. 10

10. Write short notes, *any two* of the following : 5x2=10

    (a) Heat run test of single phase transformer

    (b) Scott connection

    (c) Distribution transformer
