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BIEE-004

B.Tech. – VIEP – ELECTRICAL ENGINEERING (BTELVI)

Term-End Examination

00856

June, 2016

BIEE-004 : ELECTRICAL MACHINES-I

Time : 3 hours *Maximum Marks : 70*

Note : *Answer any **five** questions. All questions carry equal marks. Use of scientific calculator is allowed.*

1. (a) Explain the constructional features and working principle of a DC generator. 7

(b) How are ratings of electrical machines expressed ? Describe briefly various parts of a DC machine. 7

2. (a) Sketch the following types of DC generators :

(i) Shunt

(ii) Series

(iii) Compound

State with reasons where each is used. 7

(b) What do you mean by armature reaction in DC machines ? Show on a diagram its effect on the flux distribution. 7

3. (a) Explain the term 'commutation' in DC machines. How can commutation be improved ? 7

(b) A separately excited generator, when running at 1000 r.p.m. supplied 200 A at 125 V. What will be the load current when the speed drops to 800 r.p.m., if it is unchanged ? Given that the armature resistance = 0·04 Ω and brush drop = 2 V. 7

4. (a) Enumerate the three most important characteristics of DC generators. 7

(b) Explain speed – current and torque – current characteristics of a DC series motor. 7

5. (a) Compare an autotransformer with a two-winding transformer. 7

(b) Compare lap and wave windings. Also write their advantages. 7

6. (a) What are the conditions for parallel operation of two 3-phase transformers ? 7

(b) Distinguish between power and distribution transformers. 7

7. (a) The no load ratio required in a single phase, 50 Hz transformer is 6600/600 V. If the maximum value of flux in the core is to be about 0·08 Wb, find the number of turns in each winding. 7

(b) Outline the procedure for performing the open-circuit test. What useful information is obtained from the open-circuit test ? 7

8. Write short notes on any ***two*** of the following : *7+7=14*

(a) E.M.F. generation in DC machines

(b) Equivalent circuit of a transformer

(c) Tap changing transformers