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BIEE-008

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

Term-End Examination

December, 2015

BIEE-008 : ELECTRO-MECHANICAL ENERGY CONVERSION - I

Time : 3 hours *Maximum Marks : 70*

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

1. (a) Explain Electro-mechanical Energy Conversion system with the help of a block diagram. 7

(b) Discuss briefly about torque production in rotating machine. Also, give examples of singly excited and doubly excited magnetic field system. 7

2. (a) Describe the working of a three-point starter for d.c. shunt motor, with the help of a neat diagram. 7

(b) Compare and distinguish a three-point starter with a four-point starter. 7

3. (a) A 500 V series motor takes current of 180 A to develop 80 kW. The armature and series field resistances are 0·1 ohm and 0·04 ohm respectively. If the output is reduced to 40 kW, find the input current and efficiency. 7

(b) Describe the Ward Leonard method of speed control of d.c. motor. 7

4. (a) Draw and explain the phasor diagram of a single phase transformer on inductive load. 7

(b) A 10 kVA, 400/200 V single-phase 50 Hz transformer has a maximum efficiency of 92% at 80% of full load at unity p.f. Determine the efficiency at full load at 0·8 p.f. lagging. 7

5. (a) What is Sumpner's test ? Draw a circuit diagram to conduct this test and explain its operation. 7

(b) What is an auto-transformer ? Derive an expression for saving of copper, when an auto-transformer is used. 7

6. (a) Draw and explain Scott connection of a transformer. 7

(b) List the advantages and disadvantages of 3-phase transformer. 7

7. Write short notes on any ***two*** of the following : $2 \times 7 = 14$

(a) Voltage Regulation of Transformer

(b) Swinburne's Test

(c) Armature Reaction in DC Machine