

**B.Tech. - VIEP - ELECTRICAL ENGINEERING  
(BTCLVI)**

**Term-End Examination**

00793

**December, 2016**

**BIEE-008 : ELECTRO-MECHANICAL ENERGY  
CONVERSION - I**

*Time : 3 hours*

*Maximum Marks : 70*

---

**Note :** Attempt any *seven* questions out of ten. All questions carry equal marks. Use of scientific calculator is allowed. Make suitable assumptions, if needed.

---

1. Write short notes on any *two* of the following :  $2 \times 5 = 10$

- (a) Armature Reaction
- (b) Speed – torque characteristics of a d.c. series motor
- (c) Swinburne's method and no load losses

2. (a) Explain the commutation process of a d.c. generator. 5

- (b) Discuss how the effects of armature reaction are decreased using high reluctance pole tips. 5

3. (a) Explain the speed – torque characteristics of a d.c. shunt motor. 5
- (b) Discuss series-parallel field control for a d.c. series motor. 5
4. Explain the Ward Leonard method of speed control for d.c. motors with neat schematic diagram. 10
5. (a) A d.c. shunt motor with an armature circuit resistance of  $0.3 \Omega$  operates a hoist whose efficiency is 70%. Calculate the armature current while raising a load of 800 kg at a speed of 3 m/sec. 5
- (b) If supply voltage falls from 230 V to 190 V, determine the hoist speed. 5
6. With the help of a neat schematic diagram, explain in detail Swinburne's test of d.c. machines. 10
7. Explain the diagram for Hopkinson's test for d.c. shunt machines, in detail. 10
8. (a) Give the advantages of a 4-point starter over a 3-point starter. 5
- (b) Explain the construction and working of autotransformer. 5

9. Explain Sumpner's test for single-phase transformers with the help of a neat schematic diagram. 10
10. Explain the parallel operation and loading sharing of three-phase transformers. 10
-