



**SF-7103**

**B. E. III (Sem. - VI) (Electrical) Examination**  
**May/June - 2011**  
**Electrical Drives & Utilization of Electric Power**

Time : 3 Hours]

[Total Marks : 100

**Instruction :**

नीचे दशांशिक निशानियाणी विगतो उत्तरवडी पर अवश्य लपवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="text" value="B. E. 3 (SEM. - 6) (ELECTRICAL)"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="ELECTRICAL DRIVES &amp; UTILIZATION OF ELECTRIC POWER"/>	<input type="text"/>
Subject Code No. : <input type="text" value="7"/> <input type="text" value="1"/> <input type="text" value="0"/> <input type="text" value="3"/>	Section No. (1, 2,.....): <input type="text" value="1&amp;2"/>
Student's Signature	

**SECTION - I**

- 1 (a) Answer the following in one or two sentences (each carries two marks) 10
- (i) Differentiate between active torque and passive torque.
  - (ii) Draw speed-torque curve of a constant power type load.
  - (iii) List the advantages of fly-wheel for the purpose of load equalization.
  - (iv) Define waste light factor.
  - (v) Field excitation is used for speed control below the base speed. State true or false. Justify your answer.
- (b) Explain Ward-Leonard system of speed control with diagram. Also state the advantages and disadvantages of this method. 7
- (c) Define lamp efficiency and depreciation factor. 3
- 2 (a) Explain operation of an electrical drive in all the four quadrants. 7
- (b) A 500 V 45 kW 600 rpm DC shunt motor has a full load efficiency of 90%. The fixed resistance is  $200 \Omega$  and armature resistances  $0.2 \Omega$ . Find speed at which the machine will develop an electromagnetic torque equal to

rated value under following condition. (Assume field current is maintain constant).

- (i) Plugging with an external resistance of  $5.5 \Omega$
- (ii) Dynamic braking with an external resistance of  $2.6 \Omega$

**OR**

- 2 (a) Explain modified speed torque characteristics of D.C. shunt motor. **7**
- (b) Explain Ward-Leonard system of speed control with diagram. Also state the advantages and disadvantages of this method. **8**
- 3 Answer any **three** : **15**
  - (i) Explain the method of dielectric heating.
  - (ii) Classify power modulator and explain its function in brief.
  - (iii) Write a brief note on gas discharge lamps.
  - (iv) Derive the criteria for judging the steady state stability of an electric drive.
  - (v) Show that for a DC motor, the energy lost at starting is dependent on the nature of speed variation but not on the armature resistance.

## SECTION - II

- 4 (a) (i) Which type of braking is used almost exclusively for synchronous motor ? **1**
- (ii) Define luminous flux. **1**
- (iii) Define lumen. **1**
- (iv) Pole changing method is applied mostly for \_\_\_\_\_ type of induction motor. **1**
- (b) Explain different systems of traction in detail. **10**
- (c) Explain typical speed time curve related to traction. **6**
- 5 (a) Explain different electrical braking of 3-phase induction motor. **8**
- (b) Explain different methods of starting of 3-phase induction motor. **7**

**OR**

- 5 (a) Explain modified speed torque characteristics of 3-phase induction motor. 8
- (b) Explain different speed control method of 3-phase synchronous motor. 7
- 6 Write short notes (any **three**) 15
- (i) Induction heating
  - (ii) Electric welding
  - (iii) Factory lighting
  - (iv) Arc furnaces
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