* S E - 6 1 2 9 / 2 0 0 *

SE-6129

B. E. II (Sem - III) (Ele.) Examination

April / May – 2011

Electrical Technology (Chemical)

Time : **3** Hours] [Total Marks : **100**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. E. 2 (Sem - 3)**

Name of the Subject :

☛ **Electrical Technology (Chemical)**

☛ Subject Code No. : **6 1 2 9** ☛ Section No. (1, 2,.....) : **Nil**

Seat No. :

Student's Signature

(2) Attempt all the questions.
(3) Make suitable anumption wherever necessary.
(4) Figures to the right indicate full marks.

1 (a) Fill in the blanks : **10**

(1) The AC voltage produced in armature of the DC generator is converted to DC voltage of after terminals with the help of _____ .

(2) By flux control method, we can get speeds _____ than the rated speed.

(3) _____ DC motor can not be run on no load condition.

(4) _____ loss is not common between a transformer and rotating machines.

(5) Transformer works on the principle of _____ .

(6) While conducting S.C. tests on the transformer _____ side is short circuited.

(7) During S.C. test on transformer _____ losses are maximum.

(8) Laminations in armature core reduces the _____ loss.

(9) In a D.C. motor majority of cu losses occurs in _____ .

(10) Commutator brushes are generally made up of _____ .

(b) Justify following sentences : **10**

(1) DC series motor can not be run on no load condition.

(2) Starters are required to start DC motors.

(3) DC shunt motor is preferred when constant speed is required.

(4) Commutator converts ac supply DC supply.

(5) All day efficiency.

2 (a) Explain various power stages of a DC generator. **7**
Define various efficiencies and derive condition for maximum efficiency.

(b) A 4.pole DC generator is delivering 20 A to a load of 10 Ω. If the armature resistance is 0.5 Ω and the shunt field resistance is 50 Ω, calculate the induced emf and the efficiency of the machine. All the drop of 1V per brush. **8**

OR

2 (a) Derive the emf equation of a DC generator. **5**

(b) What is back emf ? **2**

(c) The input to 230 V DC shunt motor is 11 kW. **8**
Calculate (a) the torque developed, (b) the efficiency, (c) the speed at this load. The particulars of the motor are as follows :
No-load current = 5 A, No load speed = 1150 rpm
Armature resistance = 0.5 Ω, shunt field resi. = 100 Ω

3 Attempt any **three** : **15**

(1) Draw and explain the working of three point starter.

(2) What is armature reaction in DC machines ? What are its remedies ?

(3) Explain losses in transformer.

(4) Describe the conditions to be satisfied for the parallel operation of two 3-phase transformer.

(5) Write a note on different types of transformer from application point of view.

4 (a) Answer the following questions : **5**

(1) Synchronize impedance methods and MMF method are same. (True or False)

(2) Synchronous speed of motor N_s = _____

(3) In case of V curve synchronory generator's armature current is decresing. (True or False)

(4) Ampereturn method and zero power factor method both are same. (True or False)

(5) In case of V curve synchronous generator and synchronous motor p.f. are lagging. (True or False)

(b) Answer the following questions : **15**

(1) EMF equation of synchronous generator

(2) DC servo motor

(3) No load test.

5 Answer the following questions :

(1) Compare squirrel cage induction motor and wound rotor induction motor. **8**

(2) The power input to the rotor of a three-phase induction motor is 50 kW. The motor runs at 950 rpm. the number of poles is 6. The frequency of supply is 50 Hz. The rotor resistance per phase is 0.3 Ω. Determine the value of rotor currenet per phase. **7**

OR

5 Answer the following questions :

(1) State working principle of synchronous machines and explain its constructions. **8**

(2) Determine the speed at which the maximum torque is developed on the induction motor having the following rating :

(a) Number of pole = 6

(b) Frquency of supply = 50 Hz

(c) Rotor resistance per phase = 0.02 Ω

(d) Rotor stand still reactance per phase = 0.55 Ω

6 Discuss briefly : (any **three**) **15**

(1) Torque speed characteristic of induction motor

(2) Hysteresis motor

(3) V curve

(4) Starting of synchronous motor

(5) Blocked rotor test.
