S.B. Roll No……

Electrical Machines – I
4th Exam/2520/June'2015

Duration : 3 Hrs **M. Marks : 75**

Section A

Q.1 Fill in the blanks: (15x1= 15)

i. The direction of induced emf can be determined by applying _____.
ii. Torque , Tα _____θ
iii. Voltage equation of d.c motor is V= E_b_____.
iv. As the load is increased the speed of a dc shunt motor _____ slightly.
v. In DC motor, starter is used to _____ the starting current.
vi. The current drawn by a 120 V dc motor of armature resistance 0.5Ω and back emf 110 V is ___.
vii. There is _____ difference in the construction of a dc generator and motor.
viii. A 4-pole, d.c lap winding will have ____ parallel paths.
ix. Transformers are rated in _____.
x. EMF equation of a transformer is _____.
xi. Short circuit test is conducted in a transformer to calculate _____ losses.
xii. Transformers works on _____ supply.
xiii. Transformer steps up or steps down- _____.
xiv. Tap changers are provided on the ____ voltage winding of the transformer.
xv. ON cooling of transformer means _____ cooling.

Section B

Q.2 Attempt any six questions **(6x5= 30)**

i. An electrical motor or generator is also called electro –mechanical energy conversion device, why?
ii. Explain field control method for speed control of D.C motors .
iii. Compare generator and motor action.
iv. Why is a starter necessary for a DC motor?
v. Explain the working principle of a transformer.
vi. What happens when d.c voltage is applied to the primary of a transformer?
vii. What is an isolation transformer? Give its applications.
viii. State and explain the conditions necessary for parallel operations of two single phase transformers.

Section C

Note: Attempt any three questions. **(3x10= 30)**

Q3. Name the various parts of a D.C machine and give the function of each part. **(10)**

Q4. (a) Derive emf equation of a D.C generator. **(5)**

(b) A 220 V d.c. machine has an armature resistance of 0.5 ohm. If the full load armature current is 20 A, find the induced emf when machine acts as a (i) generator (ii) motor. **(5)**

Q5. Explain open circuit test of a single phase transformer giving circuit diagram. Also mention use of this test. **(10)**

Q6. (a) What are various losses in a transformer? **(5)**

(b) The primary winding of a 50 Hz single phase transformer has 480 turns and is fed from 6400 V supply. The secondary winding has 20 turns. Find the peak value of flux in the core and secondary voltage. **(5)**

Q7. Write short notes on:

(a) On load tap changer **(5)**
(b) Cooling of transformer **(5)**