USN ☐☐☐☐☐☐☐☐☐☐

Sixth Semester B.E. Degree Examination, June-July 2009
Electrical Drawing and CAD

Time: 3 hrs.   Max. Marks:100

Note: 1. *Answer any FOUR questions from part A and ONE question from part B.*
2. *Assume any missing data.*

PART – A

1 a. Draw a neat diagram showing the schematic of a thermal plant with all the details. **(08 Marks)**
   b. Draw a single-line diagram of a 66 kV/11 kV substation. Using standard symbols, show all the necessary equipments.   **(12 Marks)**

2 Draw the winding diagram, sequence diagram, for a DC machine showing the position and polarity of brushes with the following details :
   Number of slots : 20
   Number of commutator segments : 10
   Number of poles : 4
   Winding type : simple progressive lap   **(20 Marks)**

3 Draw the developed winding diagram for an AC motor with following data :
   Number of slots - 12 , number of poles – 4 , number of phases – 3 , winding type : double layer , full – pitched lap connected in star.   **(20 Marks)**

4 Draw the following views of a 3-phase, core type, 250 KVA, 11KV/400V transformer :
   a) Front elevation in full section,
   b) Plan in full section.
   Dimensions of various parts are given below :
   Core : Cross section of the core = 3 step core
             Diameter of circum circle = 24 cm.
             Distance between adjacent core centres = 42.5 cm.
   Yoke : height of yoke = 25 cm
       LV winding :   Outer diameter of LV coil = 28.3 cm
                      Inner diameter of LV coil = 25 cm
                      Height of LV winding = 43.5 cm
                      Number of turns per phase = 12
       HV winding :   Outer diameter of HV coil = 41.5 cm
                      Inner diameter of HV coil = 34.3 cm
                      Height of HV winding = 43.5 cm
                      Number of turns per phase = 572
                      Total height of transformer = 100 cm

                                                                    (20 Marks)

5 Draw to suitable scale (i) End view and (ii) elevation with top half in section of a DC machine, having the following particulars :

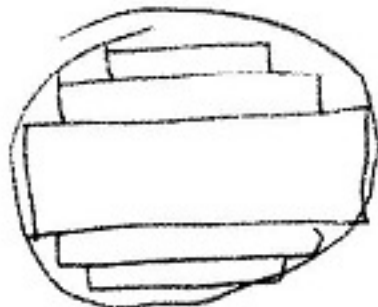|	
Yoke details :	Outer diameter – 49.6 cm
	Inner diameter – 40 cm
	Axial length – 16 cm
Main pole details :	Number – 4
	Width – 6 cm
	Height – 12.6 cm
	Air gap – 1.6 mm
Inter pole details :	Number – 4
	Width – 9.5 cm
	Height – 11 cm
	Air gap – 2.5 mm

(20 Marks)

6 Draw the half sectional end view and half-sectional elevation of the cage rotor of a 3-phase induction motor. Show the method of fixing the rotor to the shft. The following are the details :
Diameter of the rotor – 17.88 cm
Length of the rotor – 13.5 cm
One radial cooling duct – 1 cm wide
Rotor conductor diameter – 0.9 cm
Distance between ring and core – 0.5 cm
Diameter of the shaft – 3.5 cm
Six vanes are fixed to the rotor end plates to help cooling.

(20 Marks)

PART – B

7 a. Explain the following commands with examples :
   i) MIRROR   ii) TRIM   iii) OFFSET   iv) HATCH   v) ROTATE   (10 Marks)
   b. Explain the step-by-step procedure for drawing a simplex lap winding.   (10 Marks)

8 Write the prompt response columns to draw the plan of a transformer limb shown below, to a suitable scale. Radius of circumscribing circle is 25 cm.

(20 Marks)