USN | | | | | | | | | | |

2002 SCHEME

Sixth Semester B.E. Degree Examination, Dec.08 / Jan.09
Electrical Drawing and CAD

Time: 3 hrs. Max. Marks:100

Note :1. ***Answer any Four full questions from Part A on drawing sheets.***
2. ***Answer any One question from Part B in answer booklet.***

Part A

1 a. Draw the single line diagram of a generating station having 4 alternators, 10 MVA each, running in parallel showing details of the circuit breakers, isolators, bus couplers, transformers which step up voltage from 11 KV to 132 KV, 15 MVA each, Instrument-transformers, Lightning arrestors. **(12 Marks)**

b. Draw the schematic arrangement of high head hydroelectric plant. **(08 Marks)**

2 Draw the armature winding of a DC machine with 4 poles, 14 slots, double layer progressive lap. Show the position of brush and direction of induced emf. **(20 Marks)**

3 Draw the developed winding diagram of an AC machine with 4 poles, 24 slots, 3φ lap winding arranged to reduce the 5^{th} harmonic to the extent possible. **(20 Marks)**

4 Draw the sectional plan of one limb showing the windings of an oil immersed 11000/440 V, 1φ transformer with the following data:
Core – Cruciform, diameter of circumscribing circle = 33 cm, thickness of lamination = 0.35 mm. core laminations are fixed by means of two end plates 3 mm thickness by a bolt of diameter of 1.2 cm. Inside and outside diameter of LV and HV windings are 35 cm, 39 cm, 44 cm and 49 cm respectively. Show the arrangement for keeping coils in position and the oil ducts. **(20 Marks)**

5 Draw the end view and elevation of the stator core as per details given below:
i) Inside dia of stator stampings = 18 cms.
ii) Slot size = 2.9× 0.95 cms
iii) Depth of iron behind the stator size = 4 cms.
iv) Length of stator core = 13.5 cms.
v) Total slots = 36
vi) Show only 3 slots in the view.
vii) Scale : Half full scale. **(20 Marks)**

6 Draw to $\frac{1}{4}^{th}$ scale the sectional end view (right half in section) of a 50 KW DC generator with the following main dimensions:
i) Thickness of yoke = 5 cm
ii) Number of main poles = 4
iii) Total height of the pole = 14 cm (Including pole shoe)
iv) Width of the main pole = 12 cm
v) Main pole winding = 7cm × 3cm
vi) Air gap = 0.4 cm
vii) Pole arc = 63% of pole pitch
viii) External diameter of armature stamping = 38 cms
ix) Internal diameter of armature stamping = 20 cm
x) Number of slots = 32
xi) Size of slots = 3.5 cm × 1.5 cm
xii) Shaft dia = 6 cm
Armature stamping are mounted on the cast iron spider of external diameter 20 cms. Show few slots on the armature. (assume any missing data) **(20 Marks)**

Part B

7 Explain the following AUTOCAD commands with appropriate examples and figures:

a. Array and types of arrays.
b. Significance of layers.
c. Blocks and insertion of blocks.
d. Difference between scale and stretch.
e. Copy and paste.

(20 Marks)

8 Explain the step by step procedure to create a single line diagram of a generating station in AutoCAD software with the following details:

a. 100 MVA, 11 KV, 3φ, λ connected generator : 1 number
b. One bus bar.
c. 100 MVA, 11/220 KV, 3φ, λ-Δ transformer : 1 number
d. 220 KV outgoing lines : 2 number.

(20 Marks)