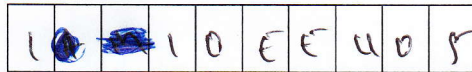


USN



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06EE65

Sixth Semester B.E. Degree Examination, June 2012
Electrical Drawing and CAD

Time: 3 hrs.

Max. Marks: 100

Note: Answer any TWO full questions from Part-A.
and any THREE full questions from Part-B.

PART – A

- 1 a. Draw a neat schematic arrangement of a nuclear power plant. ⁻⁶ (08 Marks)
- b. Draw the single line diagram of a typical substation with the data of the equipment given below:
- i) Two incoming lines of 110 kV
 - ii) Two transformers of 110/11 kV
 - iii) Double bus bars for high tension and loco tension sides have to be indicated.
 - iv) Bus couples on high tension side only.
 - v) Feeders of 11 kV at low tension side total no = 6.
- In appropriate position indicate lightning arrestors, CT, PT, earthing switch, wave traps and coupling. Condensers at incoming lines and station auxiliary transformer of 11 kV/415 V. (12 Marks)
- 2 Draw to a suitable scale the longitudinal cross section of a limb of a 3-phase oil cooled power transformer showing the H.T and L.T windings. ⁻¹²
- Diameter of circumscribing iron core circle = 22.6 cm.
Diameter of secondary winding in two concentric layers, inside = 25 cm.
Outside = 28.1 cm, Height of the secondary winding = 41.2 cm
Diameter of primary winding inside = 32 cm, Outside = 36.8 cm.
Total height off the primary winding including 10 spacers = 40 cm. (20 Marks)
- 3 Draw to quarter scale a half sectional end elevation looking from the shaft end of a 100 kW. D.C. generator with the main dimensions as given below:
- No. of poles = 4
External diameter of armature stamping = 41.5 cm.
Inside diameter of armature slamping = 21 cm.
No. of slots = 39
Size of slot = 3.5 cm × 1.2 cm.
Main pole:
Height = 16 cm
Width = 12 cm
 $\frac{\text{Pole arc}}{\text{Pole pitch}} = 62\%$
Inter pole = 4.4 cm × 15 cm
Air gap at main pole = 0.5 cm
Thickness of yoke = 6 cm
Shaft dia at coupling end = 8 cm
The machine has end shield bearing. The armature stampings are mounted on a cast iron spider keyed to the shaft and clamped between end plates any missing data may be assumed. (20 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

- 4 A low speed salient-pole alternator with stationary armature for which the details are as follows:
 Diameter of shaft = 6"
 Diameter of rotor = 3 feet
 Height of pole = 6 inch
 Outer dia. of stator = 5 feet.
 External diameter of the supporting frame = 6 feet.
 No. of poles = 12
 Vertical distance of the base plate from the center line of the alternator to the ground level = 2 feet.
 Length of the base plate of the alternator = 7 feet.
 Width of the base plate = 3 feet.
 Draw to a scale of 1 inch = 1 feet.
 Half-sectional end view of the alternator showing all the essential parts. (20 Marks)

PART – B

- 5 Draw a neat development winding diagram for a D.C. machine, with the following details:
 No. of poles = 4
 No. of conductors = 30
 Type of winding = wave connected retrogressive type.
 Show the position of poles, mark the position and polarity of the branches. Also draw the sequence diagram. (20 Marks)
- 6 Draw the developed winding diagram for the armature of a 3-phase synchronous machine with details given below:
 No. of poles = 4 No. of slots = 24
 Winding type = full pitched, lap connected indicate the direction of rotation. (20 Marks)
- 7 a. With examples explain the following commands:
 i) Mirror ii) TRIM iii) HATCH iv) OFFSET v) ROTATE. (10 Marks)
- b. Explain the step by step procedure to draw a simplex lap winding. (10 Marks)
- 8 Draw proportionate preparatory sketch and explain step by step procedure to draw a single line diagram of generating station with the following details:
 i) Generators: One 100 MVA, 11 kVm 3-phase star connected.
 ii) Bus: Double bus with a bus coupler
 iii) Transformer: One 100 MVA, 11/220 kV.
 iv) Out going: Two 220 kV. (20 Marks)

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