EE65

Sixth Semester B.E. Degree Examination, Dec. 07 / Jan. 08
Electrical Drawing and CAD

Time: 3 hrs.

Max. Marks:100

Note :1. *Answer any FOUR questions from Part A on drawing sheet.*
**2.** *Answer any ONE question from Part B in answer booklet.*

PART A

1 Draw the single line diagram of a 66/11 kV substation with following details:
   a. 66 kV incoming line – 2 numbers.
   b. Line OCB's 66 kV – 2 numbers.
   c. Step down transformer 66 kV/ 11 kV – 2 numbers.
   d. Bus coupler for H.T side only.
   e. Feeders 11 kV radiating from L.T bus – 4 numbers.
   f. L.T. circuit breakers for feeders – 4 numbers.
   g. Duplicate bus bar for H.T. and L.T. to be provided.
   h. Position of lightning arresters, CT's and PT's   **(20 Marks)**

2 Draw the developed winding diagram of a six pole 18 armature slots, double layer, lap wound dc generator. Draw the sequence diagram. Show the position and polarity of brushes. **(20 Marks)**

3 Draw the developed winding diagram of an alternator with the following data:
   Number of poles – 4; Number of slots – 36; Number of phases – 3; Type of winding – Single layer wave; Type of connection – Star.   **(20 Marks)**

4 Draw to half scale the sectional plan of one limb showing the winding on a core of an oil immersed 12000/500 volts, 3 – phase transformer. The core is 24 cm in diameter and has 3 steps. The internal and external diameters of low tension windings are 25.4 cm and 29.8 cm respectively and of high tension 2.3 cm thick and outer diameter 40.5 cm. Show the arrangements for keeping the coils in position and the oil ducts.   **(20 Marks)**

5 Draw to quarter scale a half sectional end elevation looking from the shaft end of a 100 kW dc generator with the dimensions as given below:
   Number of poles = 4 ; Number of slots = 39; Size of slot = 3.5 × 1.2 cm
   External diameter of armature stamping = 41.5 cm
   Inside diameter of armature stamping = 21 cm
   Main pole :
   Height = 16 cm, Width = 12 cm, Pole arc / Pole pitch = 62%, Interpole = 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. Other missing data may be assumed.   **(20 Marks)**

6 Draw the half sectional end view of a 10 hp squirrel cage motor with the following dimensions:
   Inside diameter of stator = 18 cm
   Length of stator = 13.5 cm
   On radial cooling duct in stator and rotor = 1 cm wide
   Stator slot size = 0.95 × 2.9 cm
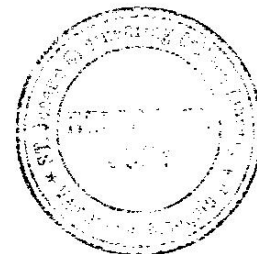
Number of slots = 36

Outside diameter of stator = 32 cm

Air gap length = 0.06 cm

Rotor has 31 slots of size 1 cm diameter and is directly mounted over the shaft.

Diameter of shaft below rotor = 2.4 cm. The rotor shaft is supported in the end cover by means of ball bearings. Other missing data may be assumed.   (20 Marks)

PART B

7   Explain the following Auto CAD commands with appropriate example:
   a. Array.
   b. Dimensioning.
   c. O snap.
   d. Text format.
   e. TRIM.   (20 Marks)

8   Draw a developed winding diagram using auto CAD.

Number of conductors = 30

Number of poles = 4

Winding type = Simplex progressive wave single layer.

Number of commutator segment = 15.   (20 Marks)

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