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Sixth Semester B.E. Degree Examination, December 2018

(ELECTRICAL & ELECTRONICS ENGINEERING)

COMPUTER AIDED ELECTRICAL DRAWING

Time: 3 Hours

Max. Marks: 80

Instruction:

1. Answer Question 1 or 2 and 3 from PART-A.
2. Answer Question 4 or 5 from PART-B.
3. Use of CAD tool that satisfies that requirement of the syllabus is permitted. Suitable data may be assumed if not given.

PART - A

1. Draw the simplex retrogressive wave winding with a 4 pole DC machine having 42 armature conductors, 21 slots. The winding is double layer. Draw the sequence diagram show position of brush, direction of current etc. (25 marks)

OR

2. Draw the developed winding diagram of an AC machine having the following details. (25 marks)
 - Speed = 3000rpm
 - No of slots = 24
 - Frequency = 50 Hz
 - Phase = 3 short pitch by $\frac{5}{6}$ the double layer lap & Y connected.

3. Draw the Single line Diagram of a substation having the following equipment.

- a) Incoming lines: 11KV, 50 Hz, Two
- b) Outgoing lines: 33KV, 50 Hz, Four
- c) Transformer: 11/33KV, 3 phase, Y/ Δ , Two
- d) Bus Bars: 11 KV, One
33 KV, Two

Show the positions of CT, PT, Isolating Switches, Lightning arrestors, circuit breakers.

(15 Marks)

PART – B

4. Draw to suitable scale, the half sectional elevation and plan of a 10KVA, 50 Hz, 1100/110V single phase, shell type transformer with following data:

Magnetic circuit:

Central leg = 70mm x 93.5 mm
 Outer leg = 70 mm x 46.7mm
 Yoke = 70 mm x 57.2 mm
 Window = 200 mm x 75 mm

HV winding:

Number of turns = 1000
 Number of layers = 12
 Dimensions of insulated conductor = 2.1 mm x 2.1 mm
 Height of the coil = 178.5 mm
 The coil is divided into two sections with 6.35mm duct in between, through which the HV leads are brought out.
 Depth of each section = 15.6 mm

LV winding:

Number of turns = 100
 Wound in two sections, layers/section = 2
 Dimensions of insulated conductor = 4.67 mm x 7 mm
 Height of the coil = 182 mm
 Depth of each section = 9.94 mm

Insulation:

Between layers = 0.6 mm
 Between core and LV winding = 2.5 mm
 Between LV and HV = 3.81 mm
 Between yoke and end of coils: for LV coils 4mm mica pad and 5 mm press board spacer blocks, for HV coils: 3.175 mm mica pad and 7.575 mm press board spacer blocks.

(40 Marks)

5. Draw the i) half sectional elevation and ii) half sectional end view of a DC machine, with the following details:

Shaft diameter = 5 cm
 Axial length of armature = 25 cm
 Number of poles = 4
 Thickness of the yoke = 3.5 cm
 Pole width = 12 cm
 Outside diameter of armature = 36 cm
 Diameter of commutator = 23 cm
 Number of interpoles = 4
 Pole height = 16 cm
 Indicate all the parts

(40 Marks)

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