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## Sixth Semester B.E. Degree Examination, June/July 2019

### (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.
       Speed = 3000rpm
       No of slots = 24
       Frequency =50 Hz
       Phase = 3 short pitch by 5/6 the double layer lap & Y connected.          (25 marks)

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/ $\Delta$ , 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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