CBCS Scheme

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

15EE651

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 <u>or</u> 2 <u>and</u> 3 from PART-A.

2. Answer Question 4 <u>or</u> 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. Design and draw a wave winding (progressive) for an armature with 34 conductors accommodated 17 slots, 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.
   No. of phase = 3
   No. of poles = 4
   No. of slots = 36 full pitch lap winding double layer and delta connected.
   (25 marks)

3. Draw the Single line Diagram of a substation having the following equipment.
   a) Incoming lines:110KV, 50 Hz, One
   b) Outgoing lines:13.2KV, 50 Hz, Three
         11KV, 50 Hz, Four
   c) Transformers: 15MVA, 110/13.2 KV, 3 phase, Δ / Y, One
         8MVA, 110/11KV, 3 phase, Δ / Y, One
   d) Auxiliary station transformer: 750KVA, 11KV/400V, Δ / Y, One.
   e) Bus Bars: 110KV, One
        13.2 KV, One
        11 KV, One

   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 to scale a) half sectional end view b) front view of alternator with the following data:

   Diameter of shaft = 7.6 cm

   Height of pole = 7.6 cm

   Diameter of frame (outer) = 92 cm

   Length of yoke = 22 cm

   Diameter of the rotor = 46 cm

   Outer diameter of the stator = 76 cm

   Number of poles = 10

   Length of stator = 16 cm

   The rotor is mounted on a spider fixed to the shaft by a key.

   Shaft diameter = 5 cm.

   Total height of the motor = 81 cm.

   (40 marks)

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