PART A

Answer any two questions:

1. Draw the full sectional elevation and plan of a 3 phase transformer for the dimensions given below:
   - Core dia-22cm
   - Height of core-48cm
   - Height of yoke-25cm
   - Centre to centre distance between the cores-35cm

2. (a) Draw the half sectional elevation of an armature commutator assembly for the given dimensions:
   - Armature dia-45cm, shaft dia-10cm
   - Armature core length-22.5cm
   - Armature winding overhang-15cm
   - Commutator dia-28cm
   - Length of commutator segment-10cm
   Assuming missing data

   (b) Draw the half sectional view of a pin insulator

3. Draw the single diagram of 220KV substation with all equipment and specifications.

PART B

Answer any one question:

4. (a) Draw a half sectional end view and longitudinal view of a 60HP, 4 pole DC shunt Motor with suitable scale.

   - Armature:
     - Outside dia=18.5cm, length=13.5cm
     - No.of slots=24, size of slots=0.7*2
   - Main pole:
     - Total Height=11cm, width=7cm
     - Pole arc=10cm, length of pole=13cm
   - Inter pole:
     - Size=2*10.8cm, length=11cm
   - Commutator:
     - Dia=13cm, length=10cm
     - Width of field winding=2cm
     - Width of interpole winding=1cm

   Assume any missing data. Given that the armature is directly mounted on the shaft and is held between two end plates.
(b) With suitable scale draw 220KV double circuit transmission tower

5. (a) Draw the following views of a 25 KVA, 400V, 1500rpm, 50Hz three phase salient pole alternator.
   End view
   Stator: Outside diameter-400mm
   Inside diameter-290mm
   Thickness of frame-36mm
   Core length-135mm
   Slots open type 48 Nos-(32*12mm) size
   Air gap length-2mm
   Rotor: pole length-135mm
   Width-70mm
   Height with pole shoe-75mm
   Shaft dia-70mm
   Assume reasonable values for other missing data

(b) Draw to a suitable scale a half sectional end view and half sectional longitudinal view of a squirrel cage induction motor with the following dimensions.
   External diameter of stator stamping=69cm
   Inside diameter of stator stamping =45cm
   Stator core length=20cm
   The stator has 54 slots and winding overhang 5cm on each side
   External diameter of rotor stamping=44.75cm
   Inside diameter of rotor stamping=25cm
   Rotor has 43 slots .The end rings have a section of 0.73*3.5cm
   The rotor is mounted on a spider fixed to the shaft by a key
   Shaft dia=5cm
   Total height of the motor=81cm
   The rotor has ball bearings carried by the end shield .
   Assume all the other missing data