Answer any two questions.

1. Draw the single line diagram of Generating station switch yard with all equipments and specifications.  

2. Sketch the following:
   a) 220 KV Double circuit Transmission Tower.  
   b) Disc Insulator.  

3. Draw a half sectional elevation of a salient pole alternator of 500 KVA.

   Stator lamination has 24 cm. length and has 5 radial ducts. The stator laminations are held by means of two end plates bolted together.

   Inside dia. of stator – 108.4 cm.

   Outside dia. of stator – 140.4 cm.

   Overhang of stator coil in each side – 16 cm.

   Dia. of rotor – 107.2 cm.

   The shaft is supported by means of two pedestal bearings 160 cm. apart. Other missing data may be assumed.
PART - B

Answer any one question.

4. Draw to a suitable scale the end and longitudinal elevation (top half in section) of a 100 kW, 500 volts, 1250 rpm, 6 pole dc shunt generator. The armature is supported over the spider and the shaft is supported by means of pedestal bearing for the dimensions given below.

Dia. of armature – 75 cm.
Length of armature – 27.8 cm.
No. of slots – 86
Size of slots – 1.11 x 5.24 cm.
Depth of iron behind the slot – 9.26 cm.
Ventilating ducts No. 3, each 1 cm wide.
Air gap length below main pole – 0.5 cm.
Main pole:
Breadth – 17.75 cm.
Height – 24 cm with shoe
Length – 25.7 cm.
Inter pole breadth – 4.63 cm; length – 20 cm.
Air gap length below inter pole – 0.8 cm.
Yoke: Thickness of yoke – 7.5 cm.
   Length of yoke – 40 cm.
Commutator: No. of commutator segments – 344
Dia. of commutator – 56 cm.
Segment pitch – 0.51 cm.
Length of commutator – 12.35 cm.
No. of brushes per spindle – 3
Shaft:
Shaft dia. below armature – 9 cm.
Shaft length between bearing centres – 120 cm.
5. Draw the half sectional longitudinal and end view of squirrel cage induction motor with the following dimensions.

External diameter of stator stamping – 69 cm.
Inside dia. of stator stampings – 45 cm.
Stator core length – 20 cm.
The stator has 54 slots each of 6 cm. x 1.5 cm. section and the wiring overhang 5 cm. on each side.
External dia. of rotor stamping – 44.75 cm.
Inside dia. of rotor stamping – 25 cm.
Rotor has 43 slots, each carrying a bar of 1.5 x 1.2 cm. section
The end rings have a section of 0.75 x 3.5 cm.
The rotor is mounted on a spider fixed to the shaft by a key.
Shaft dia. = 5 cm.
Total height of motor = 81 cm.

The motor has ball-bearings carried by the end shield. Assume dim. of the motor frame and other missing data.