C 20565

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Name.............................

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SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, JUNE 2006

EE 2K 605—ELECTRICAL ENGINEERING DRAWING

Time : Three Hours

Maximum : 100 Marks

I. (a) Draw the sectional elevation of a single phase 100 kVA, 2000/400 volts shell type transformer for the given below details. Coil to be arranged for medium reactance.

Core :

Width	=	13 cm.
Depth	=	36 cm.

Window :

Width	=	14 cm.
Height	=	24 cm.
Overall height of transformer	=	37 cm.
Overall length	=	54 cm.
Overall depth	=	36 cm.

H.T coil :

Total no. of coils	=	4 nos.
No. of turns per coil	=	48
Cross-section of conductor	=	24 sq.mm.

L.T. coil :

Total no. of coils	=	4 nos.
No. of turns per coil	=	10
Across-section of conductor	=	112 sq mm.

Any other missing data may be assumed.

Or

(b) Draw the sectional plan and elevation of a 500 kVA, 6600/400 V single phase distribution transformer tank. Detailed dimensions given below :

Core : Cruciform construction

Diameter	=	33 cm.
Width of largest stamping	=	28 cm.
Width of smallest stamping	=	17.5 cm.
Height of core	=	43 cm.
Centre of centre distance between cores	=	49 cm.

Turn over

Tank :

Width of the tank	=	65 cm.
Length of the tank	=	105 cm.
Height of tank	=	150 cm.
Total no. of tubes		
(Arranged on all sides in two layers)	=	80
Diameter of tube	=	5 cm.
Centre to centre distance between tubes	=	7.5 cm.
No. of tubes lengthwise in one side in two layers	=	25
No. of tubes widthwise in one side in two layers	=	15
Height of largest tube	=	132.5 cm.
Height of smallest tube	=	102 cm.

Any missing data may be assumed.

(25 marks)

2. (a) Draw the typical layout of an 11 kV/415 V indoor substation with two 500 kVA transformers for parallel operation. Show the details of busbar connections with protective devices on h.t. and l.t. side.

Or

(b) Draw the complete earthing layout of a distribution substation. Name all the parts and show all dimensions in the figure.

(25 marks)

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

Diameter of armature	=	75 cm.
Length of armature	=	27.8 cm.
No. of slots	=	86
Size of slots	=	1.11 × 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.
Interpole :		
Breadth	=	4.63 cm.
Length	=	20 cm.
Air gap length below interpole	=	0.8 cm.

Yoke :

Thickness of yoke	=	7.5 cm.
Length of yoke	=	40 cm.

Commutator :

No. of commutator segments	=	344
Diameter of commutator	=	56 cm.
Segment pitch	=	0.51 cm.
Length of commutator	=	12.35 cm.
No. of brushes per spindle	=	3

Shaft :

Shaft diameter below armature	=	9 cm.
Shaft length between bearing centres	=	120 cm.

Or

(b) Draw a half sectional elevation of a salient pole alternator of 500 kVA. Also draw the half sectional end view. The dimension details given below :

Laminated stator 24 cm long has 5 radial ducts and the laminations are held in position by means of two end plates bolted together :

Inside diameter of stator	=	108.4 cm.
Outside diameter of stator	=	140.4 cm.
Overhang of stator coil on each side	=	16 cm.

Frame is of box type. Rotor salient pole type, made from laminations and fixed with the spider by means of bolts inwardly :

Diameter of rotor = 107.2 cm.

The alternator is driven at 1000 rpm at 50 Hz. The shaft is supported by means of two pedestal bearings 160 cm. apart.

Show clearly in the drawing :

(i) Method of fixing the rotor pole over the spider.

(ii) Stator and frame construction.

Other missing data may be assumed.

(50 marks)