



C14-EE-407

4467

BOARD DIPLOMA EXAMINATION, (C-14)

SEPTEMBER/OCTOBER - 2020

DEEE—FOURTH SEMESTER EXAMINATION

ELECTRICAL ENGINEERING DRAWING

Time : 3 hours]

[*Total Marks* : 60

PART—A

5×4=20

Instructions : (1) Answer **all** questions.

(2) Each question carries **five** marks.

1. Draw the sectional end view of protected flange coupling for a shaft of diameter 30 mm.
2. Draw the wiring diagram of autotransformer starter.
3. Draw the neat sketch of valve-type lightning arrester and label the parts (not to scale).
4. Draw the neat sketch of 220 kV steel tower for double circuit with standard dimensions.

PART—B

20×2=40

Instructions : (1) Answer *any two* questions.

(2) Each question carries **twenty** marks.

5. (a) Develop a single-layer wave winding for a 4-pole DC generator having 32 armature slots. Draw ring diagram to show brush positions. Show the table for front and back pitch calculations. 10

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- (b) Draw the half-sectional end view and elevation of the armature core, hub and shaft whose dimensions are as follows :

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Diameter of the shaft	:	163 mm
Diameter of the core	:	528 mm
Diameter of the hub	:	465 mm
No. of slots	:	56
Radius from the centre of the axle to the bolt circle	:	170 mm
Width of the hub below the bolt	:	32 mm
Width of the hub above the bolt	:	10 mm
Flange thickness	:	10 mm
Length of the core gap equally spaced	:	250 mm with 14 mm spacer
Distance between the two hubs	:	376 mm

Assume the missing dimensions.

6. (a) Draw the sectional plan of a 3-phase, 220/660 V, 10 kVA core-type transformer with the following data :

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Cross-section of the core	:	3 stepped
Diameter of the circle	:	6.5 cm
Distance between core centres	:	18.5 cm

LT winding :

Outer diameter of 1st layer	:	9.25 cm
Inner diameter of 1st layer	:	7.0 cm
Outer diameter of 2nd layer	:	12.1 cm
Thickness of each layer	:	1.2 cm

HT winding :

Outer diameter of HT winding	:	17.0 cm
Inner diameter of HT winding	:	12.5 cm

Assume any missing data.

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- (b) Draw a neat sketch of 350 kVA, 11 kV/440 V plinth-mounted distribution transformer substation with a two-pole structure. Clearly mention the names of various parts. 10

7. (a) Draw the half-sectional end view of 5 hp, 400/440 V, 50 Hz, 1440 rpm, 3-phase squirrel cage induction motor. 10

The main dimensions have been given below :

Outside diameter of the
stator stampings = 230

Inside diameter of the
stator stampings = 164

Thickness of the stator frame = 25

Slots :

(1) Types = Open type

(2) Number = 36

(3) Size = 15×8

Length of stator core = 90

Air gap = 2

Outer diameter of the
rotor stamping = 160

Inside diameter of the
rotor stamping = 35

Rotor core length = 90

Shaft diameter :

(1) At centre = 35

(2) At bearing = 30

The rotor has totally closed-type slots and contains bare conductors which are short circuited at both sides.

Other missing data may be assumed. (All dimensions are in mm)

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- (b) Draw the neat sketch of GI plate earthing with proper dimensions as per Indian Standard and label the parts. 10
