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**C16-C-506****6625****BOARD DIPLOMA EXAMINATION, (C-16)****OCTOBER/NOVEMBER—2023****DCE - FIFTH SEMESTER EXAMINATION****CIVIL ENGINEERING DRAWING—III***Time : 3 Hours ]**[ Total Marks : 60***PART—A**

4×5=20

- Instructions :** (1) Answer **all** questions.  
(2) Each question carries **four** marks.  
(3) Part-A need not be drawn to scale.  
(4) Any missing data may be suitably assumed.

- 1.** Draw the cross-section of a pipe culvert with the following data and label the parts : 3+1

Internal dia. of pipe	=	1000 mm
Thickness of pipe	=	100 mm
No. of pipes	=	1 No.
Thickness of bedding	=	230 mm
Thickness of benching	=	300 mm
Width of both bedding and benching	=	1800 mm

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- 2.** Sketch the cross-section of an abutment of a T-beam bridge with the following data : 4
- |  |   |   |
|--|---|---|
| Road formation level                     | = | +53·600   |
| Bottom level of R.C.C deck slab          | = | +53·400   |
| F.S.L                                    | = | +52·000   |
| B.L                                      | = | +50·000   |
| Thickness of R.C.C deck slab             | = | 200 mm  |
| Depth of T-beam from bottom of deck slab | = | 450 mm  |
| Size of C.C bed block                    | = | 600 × 600 × 150 mm  |
| Top width of abutment                    | = | 600 mm  |
| Bottom width of abutment                 | = | 1200 mm (With vertical water face and other face is battered) |
| Width of C.C foundation                  | = | 1600 mm   |
| Thickness of C.C foundation              | = | 230 mm  |
- 3.** Draw the cross-section of a Soak Pit with the following data : 4
- Internal dia. = 900 mm  
Circular lining = 200 mm thick brick work with dry joints  
Total depth of pit = 1600 mm  
General GL = 300 mm below cover slab  
Inlet pipe with bend = 75 mm dia. kept at 200 mm below GL  
Cover slab = 200 mm thick
- 4.** Sketch the barrel of a Tank Sluice with Tower Head with the following data : 4
- |                        |   |  |
|------------------------|---|--|
| Vent way               | = | 900 mm × 750 mm                                |
| Barrel side wall width | = | 500 mm at top and 750 mm at bottom             |
| C.C foundation         | = | 400 mm thick with 150 mm offset on either side |
| R.C.C slab over barrel | = | 120 mm thick                                   |
- 5.** Name any four component parts of a Canal Regulator. 4×1=4

/6625

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**PART—B**

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- Instructions :** (1) Answer **all** questions.  
 (2) Part-B must be drawn to scale.  
 (3) Any missing data may be suitably assumed

- 6.** Draw the sectional elevation and plan of a square R.C.C over head tank to a scale of 1:100 with the following data and label the components :

15+10=25

Height of the tank	=	9.00 m (From GL to top of base slab)
Size of tank	=	4.80 m × 4.80 m × 1.50 m
Thickness of R.C.C side walls	=	200 mm
Thickness of R.C.C base slab	=	200 mm
Thickness of R.C.C roof slab	=	120 mm
Size of R.C.C Column	=	400 mm × 400 mm
No. of R.C.C Columns	=	4 Nos (one at each corner)
Size of R.C.C brace beams	=	400 mm × 300 mm
Spacing of brace beams	=	3.00 m C/C
Depth of R.C.C footing below G.L	=	2.10 m
Size of footing at base	=	1500 mm × 1500 mm
Thickness of footing at column face	=	300 mm
Thickness of footing at end	=	200 mm
Thickness of C.C bed (1:4:8)		
below the footing	=	230 mm
Size of ring beam below base slab	=	400 × 450 mm
Dia. of inflow pipe	=	100 mm
Dia. of outflow pipe	=	75 mm
Size of manhole cover	=	600 mm × 600 mm

Show the pipe connections, ladder, water level indicator, ventilating arrangements etc.

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7. Draw the cross-section of non-homogeneous earthen bund with the given specifications to a scale of 1 : 100 and label the components : 15

(a) **Hydraulic particulars :**

T.B.L	=	+61.500
F.T.L	=	+59.500
M.W.L	=	+60.200
General Ground Level	=	+51.000
Stripped Ground Level	=	+50.250

(b) **Earthen Bund :**

Top width	=	2.50 m
Side slopes	=	2 horizontal to 1 vertical on both water face and rear face

(c) **Hearting :**

Top width	=	1.75 m
Side slopes	=	1 horizontal to 1 vertical on both sides
Top level	=	+60.200

(d) **Cut off Trench :**

Bottom width	=	2.50 m
Side Slopes	=	1 : 1 (both sides)
Bottom level	=	+47.000

(e) **Sand Chimney :**

Thickness	=	1.20 m
Slope	=	1 : 1 (Parallel to side slope of hearting)

(f) **Sand blanket :**

Thickness	=	1.00 m and laid over longitudinal filter with its top level at + 52.400
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(g) **Rock Toe :**

Top level	=	+ 53·000
Top width	=	1·50 m out of total width 2·50 m at the level +53·200
Side slopes	=	1 : 1 on both sides
Composition	=	Rock toe is filled with broken stones of varying size ranging from 200 mm to 500 mm

On the earthen bund side, rock toe is provided with 150 mm thick fine sand and below that 250 mm thick coarse sand.

(h) **Longitudinal filter :**

Bottom level of longitudinal filter is taken 400 mm below stripped ground level in order to accommodate 250 mm thick coarse sand and 150 mm thick fine sand below that.

Stones of varying size from 250 mm to 300 mm are laid to a depth of 0·75 m and same fine and coarse sand layers are laid over stones on which casing of 1·00 m thick is provided. Bottom width is 1·50 m with 1 : 1 side slopes and same size filter media is provided in the cross filter and extended into the rock toe.

(i) **Toe Drain :**

Bottom level	=	+49·550
Bottom width	=	1·00 m
Side slopes	=	1 : 1 on both sides
Bed pitching and side revetment	=	300 mm thick rough stones are used

(j) **Protection of Upstream face of bund :**

The upstream face of bund is provided with 450 mm thick rough stone revetment over 250 mm thick gravel backing. The revetment is founded on rough stone toe wall 1·20 m wide and 1·50 m deep.

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