

6011 (3) pages

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(REVISION - 2015)

Reg. No.....

Signature

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2019

STRUCTURAL & IRRIGATION ENGINEERING DRAWING

[Time : 3 hours

(Maximum marks : 100)

- [Note :- 1. Missing data may be suitably assumed.
2. Steel tables are permitted.
3. A2 size drawing sheet to be supplied.
4. Drawings shall be neat and fully dimensioned.
5. Answer one full question from each unit.]

UNIT — I

Marks

I A Cantilever beam has the following details.

Clear span - 2.6m

Clear cover to reinforcement - 25mm

Cross section at the fixed end - 25×35cm

Cross section at the free end - 25×150cm

Main reinforcement at fixed end 5 Nos. of 18mmΦ bars and 2Nos. 18mmΦ bars curtailed at 1.6m from support.

Stirrups 8mmΦ two legged @ 150mm c/c

Draw : (a) Longitudinal section

10

(b) Plan showing main reinforcement.

5

(c) Sectional elevation at fixed and free end.

10

OR

II An Isolated column with footing has the following details.

Column size 350 × 350mm

Main reinforcement of 4 Nos. 16mmΦ bars

Stirrups 8mmΦ bars @ 150mm c/c

Footing size 200 × 200cm and thickness of 20cm at end and 40cm at the face of column, 10mmΦ 14Nos. bars at two ways.

Draw : (a) Sectional elevation at Center.

15

(b) Plan showing reinforcement details of footing.

10

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UNIT — II

Marks

III A dog legged RCC staircase has the following details.

Level difference between ground floor and first floor - 2.90m

Height of landing from floor level - 1.50m

Tread and rise - 25cm and 17.5cm.

Main reinforcement $8\text{mm}\Phi$ @ 150mm c/c

Distributors $6\text{mm}\Phi$ @ 150mm c/c

Suspender $6\text{mm}\Phi$ @ 150mm c/c

M S Balusters 90cm height

Draw : (a) Sectional elevation

15

(b) Details of reinforcement

10

OR

IV A RCC T beam and slab bridge has the following particulars.

Width of carriageway : 7.00m

Kerb : 1.50m at each end

RCC girder beam : size of beam $60 \times 130\text{cm}$, 4 Nos. @ 250mm c/c
 $20\text{mm}\Phi$ 8 Nos. in two layer using $10\text{mm}\Phi$ two legged
 stirrups @ 250mm c/c, spacer bar $20\text{mm}\Phi$ @ 500mm c/c

Stiffener beam : 60cm deep.

Slab : 25cm thick, main bars $12\text{mm}\Phi$ @ 150mm c/c, distributors
 $10\text{mm}\Phi$ @ c/c

Draw : (a) Cross sectional elevation

15

(b) Detailed sectional elevation of RCC girder beam with reinforcement.

10

UNIT — III

V (a) Single laced battened steel column having following particulars.

2 Nos. ISIC Channel $160 \times 30 \times 10\text{mm}$ placed back to back at 140mm clear spacing,
 Batten - MS flat $50 \times 8\text{mm}$ at 45° , Rivet $16\text{mm}\Phi$ (2Nos.)

Tie plate $80 \times 12\text{mm}$ (2 Nos.)

Draw: (i) Sectional Plan

5

(ii) Elevation

8

(b) The details of Double laced steel column with riveted connection are as given 2 Nos.
 ISIC Channel $150 \times 30\text{mm}$ placed back to back at 140mm clear spacing,
 Tie plate at top and bottom $200 \times 80 \times 12\text{mm}$ on each side, Lacing MS flat
 $60 \times 10\text{mm}$ at 45° .

Draw: (i) Sectional Plan

5

(ii) Elevation

7

OR

VI A steel roof truss having following particulars.

Effective span	—	9000mm
Top chord	—	2ISA90×60×60mm
Bottom Chord	—	2ISA75×75×8mm
Sag tie	—	2ISA75×75×8mm
Main strut	—	2ISA50×50×8mm
Main tie	—	2ISA50×50×8mm
Packing plate	—	6mm thick

- Draw : (a) Elevation. 15
 (b) Sectional elevation of bottom chord. 5
 (c) Sectional elevation of Sag tie. 5

UNIT — IV

VII The following are the stone masonry dam particulars.

Stone masonry with C M 1:4

Ground level	—	+ 100.00m
Bed rock	—	+ 95.00m
FTL	—	+ 111.50m
DTL	—	+ 114.50m
Top width	—	3m

Downstream up to + 105.00m slope 1:1 and upto + 111.50m 1:1.4

Upstream upto + 105.00m slope 1: 9 and upto + 111.50m 1:1.8

Drainage gallery	—	2.75 × 1.50m
Drainage shafts	—	15cmΦ at 10m c/c
Gallery with cross drainage shaft at		+ 102.00m

- Draw cross section elevation 25

OR

VIII The following are the details of septic tank for over 50 users.

Size of the tank 6.80 × 1.75m with two compartments.

Brick masonry wall 30cm thick

Bed concrete 20cm thick 1:3:6

Bed slope 1 in 10

Baffle wall 1.50m depth at inlet and outlet

Free board 0.50m

- Draw : (a) Plan 10
 (b) Sectional elevation 15

