

TED (10) 4015  
(Revision-2010)

**N20-R02000**

Reg.No.....

Signature.....

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/  
COMMERCIAL PRACTICE, NOVEMBER-2020**

**STRUCTURAL AND IRRIGATION ENGINEERING DRAWING**

[Maximum marks: 100]

(Time: 3 Hours)

- [Note: 1. Use of steel table is permitted.  
2. Missing data if any may be suitably assumed.  
3. A2 size drawing is to be supplied.  
4. Drawing shall be neat and fully dimensioned.  
5. Answer one full question from each unit.]

**UNIT-I**

I. An R.C.C. Beam is supported on walls of 300 mm thick wall over a span of 3m. It is reinforced with 3 nos, 16mm diameter steel bars and 2 nos, 12mm bars as stirrup holder 8mm stirrups at 200 mm c/c and depth of beam are 450 mm.

Draw the following views:

- (a). Longitudinal sectional elevation. (15)  
(b). Cross section at mid-span and at support. (10)

OR

II. An R.C.C Line with sunshade has the following details:

Clear opening: 1.80 m, Bearing: 200 mm, wall thickness: 300mm, depth of lintel : 200mm,  
depth of sunshade: 100mm at fixed end & 50mm at free end, projection of sunshade : 500mm  
lintel reinforcement : main bar -#8, 3 nos. Stirrup holder - #8, 2 nos.

Two legged stirrups : #6@200c/c, sunshade reinforcement: main bars-#8@150c/c,

Distributors - #6,3nos equally spaced.

Draw:- (a).Longitudinal section of the lintel. (15)

(b). Cross section of lintel and sunshade. (10)

## UNIT-II

III. A cantilever retaining wall has the following details: size of slab: 330 x 50cm,

Stem: 70 cm thick at bottom & 40cm at top, height of stem: 400cm, earth face vertical.

Stem reinforcement: main bars-#16mm@100 c/c, alternate bars are curtailed at 1.5m, 3m from bottom. Distribution bars - #12mm@250c/c

Exposed face reinforcement: main bar-#12mm@250c/c, distribution bars-#10mm@300c/c

Heel reinforcement:#16mm@180c/c both ways.

Toe reinforcement: main bar-#16mm@150c/c & distribution bar #12mm@200c/c

Draw: (a). Section across the stem showing all details. (15)

(b). Elevation for a length of 5.2m showing the main reinforcement. (10)

**OR**

IV. An RCC 'Tee-beam slab bridge' have the following details:

Bed level : + 0.00m road level : +6.00m

Clear span : 10.00m road width : 6.00m

Beam depth including slab : 500mm slab thickness : 150mm

Abutment foundation : PCC 1:4:8, 500mm thick & 1200mm wide

Abutment : RR masonry 90 cm, 70cm & 60cm thick for 2.5m, 2m&1.5m with water face

Vertical. Square wing wall with same section as abutment.

Draw: (a). Half sectional elevation. (15)

(b). Half top & bottom plan. (10)

**UNIT-III**

V. A double laced built up column have the following details:

Column: ISLC – 150 x 30 at 125mm back to back

Lacing – 6 x 10, Tie plate – 180 x 12 with rivets #20 (3nos).

Draw: (a). Elevation up to a height of 3 lacing. (15)

(b). Plan (10)

**OR**

VI. A built up steel beam is connected to a steel stanchion (column). The steel stanchion is

made of ISHB 300 x 230 x 10mm & built up beam is made of ISLD 400 x 165x8mm.

Web angle: ISA 100 x 75 x 8mm, Flange clip angle: ISA 200 x 100 x 15mm.

Rivets: 4 nos in each clip angle & web angle of 22mm diameter.

Draw: (a). Elevation of the beam column joint. (15)

(b). Elevation showing cross section of the beam. (10)

#### UNIT-IV

VII. A surplus escape have the following details:

Bed level: +10m

Full tank level : +11m

Maximum water level : +13m

Bund top level : +15m

Length of escape : 8.75m

Core wall ; PCC 1:2:4

Bottom width 1.5m

Top width: 1m

Foundation: 2m x 0.5m PCC

Foundation level: +8m

Tail channel level: +10.45m

U/S bund slope: 1:1:5

D/S bund slope: 1:2

Draw: (a). Elevation at D/S side. (15)

(b). Cross section of the escape. (10)

OR

VIII. A septic tank has internal dimension 5m x 2m & liquid depth 1.8m. Free board 0.5 & RCC cover slab 0.15m thick, CC walls of 0.3m thick, Baffle wall of size 2m height & 5cm thick, floor PCC 1:3:6 in 20cm thick. 3nos of dispersion trenches of size 1.5m x 1m x 2m at 5m away from outlet chamber. Provide suitable inlet & outlet chambers.

Draw: (a). Longitudinal section of septic tank. (15)

(b). Sectional plan. (10)

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