TED (15) 6011
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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, NOVEMBER - 2022

STRUCTURAL AND IRRIGATION ENGINEERING DRAWING

[Maximum marks: 100] (Time: 3 Hours)

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

UNIT – 1

I. (a) Draw the cross section along shorter span and longer span of a R.C.C slab for a room of 3m x 4m size with wall thickness 200 mm. Short span: (Main reinforcement) – Provide 12mm φ @ 150mm c/c with alternate bars bent up. Long span: (main reinforcement) – provide 10mm φ @ 150mm c/c with alternate bars bent up. Slab thickness: 100mm. (15)

(b) Draw to suitable scale, the fully dimensioned plan showing reinforcement at bottom and top layers separately. (10)

OR

II. A lintel with sunshade has the following details:- Clear opening 1.5m, Bearing: 200mm, Wall thickness: 200mm, Depth of lintel: 200mm, Depth of sunshade: 100mm at fixed end & 50mm at free end, Projection of sunshade: 600mm, Lintel reinforcement: Main bars 8mmφ 2 straight bars and one bent up bar. Anchor bars 8mm φ 2 nos. Two legged stirrups 6mmφ @ 200 mm c/c, Sunshade reinforcement: Mainbar 8mm φ @ 150mm c/c, Distributors 6mmφ, 3 nos. Equally spaced.

(a) Draw L/S of the lintel. (15)

(b) Draw C/S at mid span. (10)

UNIT II

III. A cantilever retaining wall has the following details:

Length of retaining wall	5.2m
Filled earth level	+104.00 m
Natural ground level	+100.00 m
Top of base slab	+99.50 m
Retaining wall slab	400 mm at top and 700 mm at bottom, earth face vertical
Base slab	500 mm thick
Toe projection	1200 mm
Heel projection	1400 m
Reinforcement details	Stem-16mmφ @100 mm c/c, alternate bars curtailed at 1/3 and 2/3
Distributors	12 mm @ 250 mm c/c
Temperature reinforcement	10mm @ 300mm c/c both ways
Heel slab	Main bar 16 mm φ@180 mm c/c, distributors 12 mm φ @ 200 mm c/c
Toe slab	Main bar 16 mm φ @ 150 mm c/c, distributors 12 mm φ @ 200 mm c/c

Draw: (a) Sectional elevation showing the main reinforcement in the retaining wall. (10)

(b) Cross section. (15)

OR

IV. Details of a RCC dog legged stair case are given below:

Room size	5m x 2.5 m
Head room	287.5 cm
Slab thickness	12.5 cm
Landing width	100 cm
Wall thickness	30 cm
Waist Slab thickness	12.5 cm
Main bars	10mm φ @ 125 mm c/c
Distributors	8mmφ @ 200mm

Draw: (a) Longitudinal section showing the reinforcement details. (15)

(b) Plan showing the arrangement of steps. (10)

UNIT III

V. A Battened column has the following details.

Column: ISLC 150x30 mm placed back to back keeping a clear distance of 125 mm between the webs. The column is provided with batten system, The sizes of end battens are 180x12mm

and intermediate battens are 100x10 mm spacing between the consecutive battens 450mm c/c

Draw: (a) Elevation (15)

(b) Plan (10)

OR

VI. Two steel beams mutually intersects the details given below.

Main beam ISLB 500@ 750N/m (or 500x200x10mm)

Secondary beam ISLB 300 @ 372N/m (or 300x120x8mm)

Cleat (web) angle 2xISA 90x90x8mm, Flange angle 2xISA 100x75x8 mm Main beam cover plate 250x10mm, 16 mm dia rivets provided suitably.

Draw: (a) Connection showing main beam in section. (15)

(b) Connection section showing secondary beam in section. (10)

UNIT IV

VII. Draw the plan and sectional elevation of a septic tank of internal size 5.00 m x 2.0m. with the following details: (25)

Masonry wall thickness	0.30 m
Base concrete	C.C 1:3:6, 5.8m x 2.8m, 200mm thick
Average liquid depth	1.30 m
Free board	0.50 m
Baffle wall	40 mm thick and depth 0.45 m provided at 1.20 m away from a. Inlet.

OR

VIII. A tank sluice with tower head has the following details.

Thickness of foundation 400mm

Full tank level + 37.00m

Maximum water level + 38.00m

Revetment level + 38.50m

Bund top level + 40.00m

Tail channel level +34.00m

Branch bund top level +35.00m

Still basin top level +35.5m

Main bund top width 2.50m

Side slope 1 in 2 on both faces.

Tower head well : Masonry wall 0.40m thick diameter 1.20m

Rectangular barrel 1.00 x 0.60m

Barrel foundation PCC 1:4:8 0.40m thick

Still basin 2.50 x 4.50m

Length of bed 25.50m

All missing data assume suitably.

Draw: (a) Longitudinal section. (15)

(b) Sectional plan through barrel. (10)

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