TED (10)–4015

(REVISION—2010)

Reg. No. .....

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SIXTH SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/ TECHNOLOGY—MARCH, 2014

STRUCTURAL AND IRRIGATION ENGINEERING–DRAWING

[Common to CE, EN and WR]

[*Time* : 3 hours

(Maximum marks : 100)

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

Marks

UNIT—I

I Draw the longitudinal and cross sectional view showing the sunshade projection from the lintel with the following details.

Projection of the sunshade	:	75cm
Clear width of opening	:	150cm
Depth of lintel	:	20cm
Width of brick wall	:	30cm
Depth of sunshade at fixed end	:	10cm
Depth of sunshade at free end	:	5cm
Bearing on either side of the wall	:	20cm

Reinforcement–lintel : Main bar 3 nos. : 12mmϕ and stirrup holder 2 nos : 10mmϕ stirrup 6mmϕ @ 15cm c/c.

Reinforcement–Sunshade : Main bars 10mmϕ @ 15cm c/c and distributor 3 nos. 8mm ϕ. 25

OR

II A simply supported two way slab has a clear span 4m × 3m supported on 30cm thick brick wall has the following detail :

Slab thickness	:	10cm
Reinforcement - shorter span	:	12mmϕ @15cm c/c (alternate bent up)
Reinforcement - longer span		
Extra bars (top and bottom at end pannels)	:	8mmϕ 4 nos.
Draw the following views of slabs.	:	1. Section along shorter span. 2. Section along larger span. 25

UNIT—II

III A keyed cantilever retaining wall has the following details :

Base slab	:	330cm × 50cm
Stem	:	70cm thick at bottom and 40 cm at top and height 100cm.
Vertical key	:	40cm thick 100cm deep.
Heel projection	:	140cm from key

Marks

Reinforcement details stem	:	Main bar 16mm ϕ @20cm c/c alternate bars curtailed at 150cm, 300cm from top of base slab. Distributors 12mm ϕ @25cm c/c. Exposed face Main bar 12mm dia @ 25cm c/c and 10mm ϕ distributors@ 30cm c/c.
Reinforcement–Heel	:	16mm ϕ @ 18cm c/c both ways.
Reinforcement–toe	:	Main bars 16mmϕ @15cm c/c, distributors 12mm ϕ @ 20cm c/c.

Draw the section across the stem, show all details of reinforcement. 25

OR

IV Draw the plan and longitudinal sectional view of a RCC dog-legged stair case for the following details :

Room size	:	5m × 2.5m (wall thickness = 20cm)
Landing width	:	1.2m.
Width of flight	:	1.2m.
No. of steps in each flight	:	10 nos.
Rise	:	15cm.
Tread	:	30cm.
Support at ground floor level	:	90cm wide & 15cm thick concrete
Thickness of waist slab & landing	:	12cm.
Reinforcement	:	Main bar 12mm ϕ @ 12cm c/c. Distributor 8mm ϕ @ 12cm c/c.

25

UNIT—III

V Draw the plan and end view of the gusseted column base to a suitable scale with the following details.

Steel column	:	ISHB 225 @ 43.1 kg/m.
Cover plate	:	2 no: 320mm × 12mm size one on each side of flange.
Gusset plate	:	12mm thick and total depth 250mm, the edges are splayed out a slope to meet the top edge of gusset angle at the ends.
Gusset angles	:	ISA-130 × 130 × 12mm.
Base plate	:	700 × 600 × 30mm thick.
Revets connecting column Flange and gusset plate	:	18mm ϕ 16 No. each side.
Revets connecting each gusset angles and base plate	:	20mm ϕ 8 No. each.
Revets connecting gusset and gusset angle	:	20mm ϕ 8 No. each.

25

OR

Marks

VI ISLB-500 @ 75kg/m is connected to the flange of column ISWB 250 @ 40.9 kg/m used as a column. 2 angles 90 × 90 × 8mm, 36cm long are used for the connection. Six rivets are used in a line for the connection of angles to the beam and stanchion. Pitch of rivets 6cm and edge distance 3cm.

Draw to a suitable scale the side elevation and an end view showing beam in section. 25

UNIT—IV

VII Draw the sectional plan and longitudinal section of a septic tank 600 × 200cm (internal dimension) of the following particulars:

Wall thickness	:	30cm.
Inlet and outlet pipe	:	10cmϕ.
Baffle wall provided 120cm from inlet	:	5cm thick RCC 45cm depth.
Total depth of tank	:	180cm.
Base concrete	:	20cm thick at inlet and 50cm thick at outlet.(Projecting 10cm around the wall)
Free board	:	50cm.
Roof slab.	:	10cm precast slab. 25

OR

VIII The hydraulic particulars of a surplus escape (core wall type) are as given below :

Top bund level	:	+ 102.50
Maximum water level	:	+ 101.00
Full tank level	:	+ 100.00
GL and top level of concrete	:	+ 99.00
Bottom level of concrete	:	+ 98.00 (below the body wall)
Bottom width of concrete	:	150cm. (below body wall)
Top width of body wall	:	75cm
Bottom width of body wall	:	90cm
Top width of bund	:	2.00m
Length of solid apron	:	3.00m, 60cm thick.
Grouted apron	:	60cm thick
Side slope upstream	:	1 : 1.5
Side slope downstream	:	1 : 2

Cut-off wall (between solid and grouted apron) 50cm × 100cm.

Body wall divided 3 vertical offsets each 0.50m

Draw to a suitable scale the longitudinal view (half section and half elevation) of the surplus escape. 25