

Colleg Copy

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	7E7063	
B.Tech. VII Semester (Main) Examination, Dec. - 2015		
Civil Engg.		
7CE3A Design of Concrete Structures - II		

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 24

Instructions to Candidates:

Attempt any **five** questions, selecting one question from **each unit**. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination (Mentioned in form No. 205)

- 1) IS : 456 (2000) ;
- 2) IRC : 6 and IRC : 21

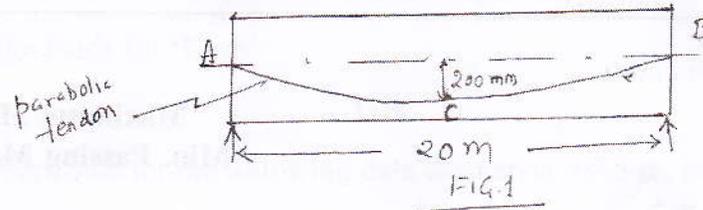
Unit - I

1. a) Name any four losses of prestress in "Pre-tensioning" and describe any one of these in detail. (2+4)
- b) A prestressed concrete beam (400 mm × 600 mm) has a simply supported span of 6m. The beam is subjected to a u.d.l. of 16 KN/m (inclusive of self weight). The effective prestressing force of 960 kN is provided through prestressing straight tendons located at 200 mm. from soffit. Determine the extreme fibre stresses in concrete at the mid span section. Give the neat sketch of the problem. (10)

OR

1. a) Write short notes on the following
 - i) Load balancing concept.
 - ii) Friction and wobble concept. (2×4=8)

- b) A prestressed concrete beam is provided with a parabolic tendon as shown in Fig. 1 which is tensioned from both the ends. If the stress in the tendons at the ends is 1050 N/mm^2 . Calculate the loss of prestress from end to centre. Take, coefficient of friction in curve, $\mu = 0.35$ and friction coefficient for wave effect $K_f = .0015/\text{m}$ (8)



Unit - II

2. a) Describe the concept of redistribution of moment with a suitable example. (6)
- b) A singly reinforced R.C.C. beam ($300 \text{ mm} \times 600 \text{ mm}$) is subjected to factored moment of 115 kN.m , factored torsion of 45 kN.m and factored shear of 95 kN . Effective cover to tension and side face reinforcement is 35 mm . Determine and provide longitudinal tension reinforcement and transverse reinforcement for this beam as per codal provisions. Give a neat dimensional sketch of cross section use M20 and Fe-415. (10)

OR

2. a) Describe the terms 'primary torsion' and "secondary torsion" (6)
- b) Determine and provide +ve and -ve flexural reinforcement for the RCC continuous beam shown in Fig.2, using coefficients, as per I.S. : 456. All the spans are subjected to 15 kN/m dead load (inclusive of self weight) and 12 kN/m live load. Use M20 and Fe-415. Beam section is $300 \text{ mm} \times 600 \text{ mm}$ and effective cover to tension reinforcement = 50 mm . (10)

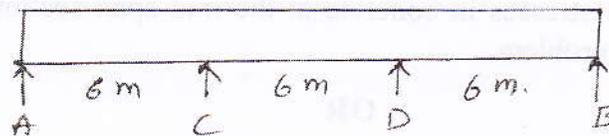


Fig. 2

Unit - III

3. a) Differentiate between “membrane theory” and ‘beam theory’ of analysis of shell structures (6)
- b) Design the vertical wells of a circular tank resting on firm ground. Use following data:
Inside diameter = 3.5 m ; Depth of water = 3 m (with free board = 360 mm)
Specific weight of water = 9810 N/m³.
use M 25 and Fe-415. (10)

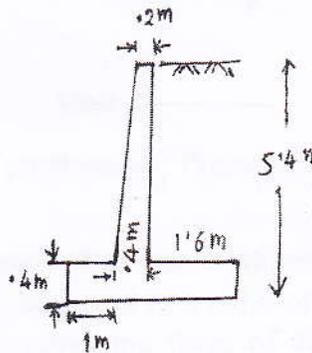
OR

3. a) Draw a neat labelled sketch (elevation) of a intz type water tank. Show the various types of forces acting on conical dome. (8)
- b) Develop the expression for meridional thrust in a circular dome. (8)

Unit - IV

4. Check the stability at the cantilever retaining wall shown in Fig. 3. If soil weighs. 18000 N/m³ and has angle of repose of 30°. The safe bearing capacity of the soil is 200 KN/m³. Use M20 and Fe-415. Also design and provide the reinforcement in stem portion. (8+8)

Fig.3



OR

4. a) Draw the typical deflected shape of stem heel slab and toe slab of a cantilever retaining wall. (4)
- b) Describe the assumptions in yield line theory. (4)
- c) Using the virtual work method, develop an expression for collapse load for an isotropically reinforced square slab fixed on all edges and subjected to uniformly distributed load. (8)

Unit - V

5. Write the short notes on following.

- a) Importance of hydraulic factors in bridge design
- b) Impact effect while considering the vehicle load.
- c) Disposition of tracked vehicle (class AA) for maximum bending moment.
- d) Design loads for 'Kerb' (4×4=16)

OR

5. Design a deck slab for the following data clear span = 5.5 m, Bearing width = 400 mm

Thickness of deck slab = 440 mm

Width of deck slab = 9.5 m

Width of foot path on either side = 1m

Wearing coat = 100 mm thick

Loading = IRC class (AA) tracked.

Use M-25 and Fe-415. (16)