University of Mumbai

Examination June 2021

Examinations Commencing from 1st June 2021

Program: Civil Engineering

Curriculum Scheme: Rev 2016

Examination: BE Semester VIII

Course Code: CE-C801 Course Name: Design and Drawing of Reinforced Concrete Structures Time: 2 hour Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks (40 marks)
1.	If the ratio of long span to short span of the slab is greater than two then this slab is called as
Option A:	Two way slab
Option B:	One way slab
Option C:	Cantilever slab
Option D:	Continuous slab
2.	In case of singly reinforced beam if Xu/d is equal to the limiting value $Xu max/d$ then the section is
Option A:	Over reinforced section
Option B:	Under reinforced section
Option C:	Balanced section
Option D:	Neutral section
3.	If area of main steel used in slab is 187.33 mm ² . What is the spacing of 8 mm diameter bar if effective depth of slab is 143 mm
Option A:	350 mm
Option B:	267 mm
Option C:	415 mm
Option D:	518 mm
4.	What is the moment of resistance of singly reinforced concrete beam of 200 mm width and 400 mm effective depth. Take M20 concrete and Fe415 steel. Let $Xu max / d = 0.479$
Option A:	59.26 KNm
Option B:	53.56 KNm
Option C:	75.21 KNm
Option D:	88.37 KNm
5.	Horizontal upper portion of a step in staircase is called
Option A:	Riser
Option B:	Landing
Option C:	Tread
Option D:	Flight

6.	If number of risers used in stair case are 12 in each flight, then number of treads in
	each flight are equal to
Option A:	13
Option B:	11
Option C:	10
Option D:	9
1.	Minimum percentage of distribution steel used in stair case is of gross cross sectional area of waist slab
Option A:	0.15%
Option B:	0.20%
Option C:	0.30%
Option D:	0.12%
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8.	What is the area of distribution steel per meter width of stair case, if thickness of waist slab is 220 mm
Option A:	225 mm ²
Option B:	320 mm ²
Option C:	264 mm ²
Option D:	210 mm ²
9.	Toe slab is a part of
Option A:	Retaining wall
Option B:	Water tank
Option C:	Stair case
Option D:	Flat slab
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10.	Counter fort retaining wall is designed when height of wall is above
Option A:	3 m
Option B:	9 m 4 m
Option D:	4 III 6 m
Option D.	
11.	A cantilever retaining wall has width of base slab 3 m. Distance of point of application of resultant force from the heel end is 1.813 m. Therefore, its
Ontion A:	
Option R.	0.51 m
Option C:	0.31 m
Option D:	0.515 m
Option D.	
12.	Which I.S code is used for design of water tank
Option A:	IS 875
Option B:	IS 800
Option C:	SP 16
Option D:	IS 3370
13.	Which type of joint in water tank is provided to serve as a continuity between first
	cast concrete and second cast concrete

Option A:	Rigid joint
Option B:	Vertical joint
Option C:	Roof slab joint
Option D:	Horizontal contraction joint
14.	What is the area of vertical distribution steel of a circular tank by IS code method
	if thickness of wall is 170 mm.
Option A:	510 mm ²
Option B:	620 mm ²
Option C:	850 mm ²
Option D:	763 mm ²
15.	Lap splices shall not be provided at
Option A:	Within a joint
Option B:	At mid span
Option C:	Long span
Option D:	Within a distance of 5d from the face of joint
16.	The capacity of structure or its member is the capacity to undergo large in-elastic
	deformations without significant loss of strength or stiffness is called
Option A:	Response
Option B:	Ductility
Option C:	Importance factor
Option D:	Durability
17.	When column terminate into a footing or mat special confining reinforcement shall
Ortion A.	extend at least mm into the footing or mat
Option A:	200 mm
Option C:	200 mm
Option D:	200 mm
Option D.	
18	A method of pre-stressing concrete in which the tendons are tensioned before the
10.	concrete is placed is called
Option A:	Pre tensioning
Option B:	Post tensioning
Option C:	Tendon
Option D:	Debonding
19.	The grade of concrete for pre stressed member should be in the range of
Option A:	M-20 to M-30
Option B:	M-80 to M-100
Option C:	M-30 to M-60
Option D:	M-15 to M-30
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20.	Loss of stress due to elastic deformation of concrete depends upon
Option A:	Relaxation of steel
Option B:	Friction and anchorage slip
Option C:	Modular ratio

Q2	Solve any One	(20 Marks)	
А	Design a 4 m x 6 m interior panel of a two way continuous load of 3000 N/m ² . Use M20 concrete and Fe415 steel.	s slab for a live	
В	Design a reinforced concrete cantilever type retaining wall having 5 m tall stem. The wall retains soil level with its top. The soil weighs 18000 N/m ³ and has an angle of repose 30°. The safe bearing capacity of the soil is 200 KN/m ² . Use M20 concrete and Fe415 steel.		
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Q3	Solve any two	(20 Marks)	
A	Design the part of an open well stair case the steps of flight mm bearing on the wall. The flight AB has a going of 1.5 m a of 1.5 m on either side of going. Thickness of the wall is 400 of steps is 1.5 m. Determine the loading on the flight AB if and tread is 250 mm. Adopt M20 concrete and Fe415 steel KN/m ² .	at AB have 150 and landing slab mm and width rise is 150 mm . Live load = 3	
В	Design a circular water tank 12 m diameter and 4 m high by method. The tank rest on firm ground. The wall of tanks is rebase. Use M20 concrete and Fe250 steel.	I. S. Code estrained at the	
С	Write short note on		
i	Factors affecting ductility		
ii	Freyssinet system of post tensioning		