Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem (Odd) Examination Dec-2022

CE3CO12 RCC Design & Drawing

Programme: B.Tech. Branch/Specialisation: CE

Duration: 3 Hrs. **Maximum Marks: 60**

Note: (a) All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.
(b) IS-456-2000 May be permitted. Assume suitable data if required.

Q.1 i. Minimum spacing between longitudinal reinforcement in any beam shall not be- **1**
(a) Greater than minimum of diameter of reinforcement and nominal size of aggregate+5mm
(b) Less than minimum of diameter of reinforcement and nominal size of aggregate+5mm
(c) Greater than minimum of diameter of reinforcement and nominal size of aggregate-5mm
(d) Less than minimum of diameter of reinforcement and nominal size of aggregate-5mm

ii. If the depth of neutral axis is greater than limiting depth of neutral axis then beam section will be considered as- **1**
(a) Under reinforced (b) Over reinforced
(c) Balanced (d) None of these

iii. Minimum cover provided in beam for moderate environmental condition will be **1**
(a) 20 mm (b) 25 mm (c) 30 mm (d) 35 mm

iv. To control deflection span to depth ratio for cantilever beam must be kept less than- **1**
(a) 20 (b) 25 (c) 7 (d) 30

v. Ratio of longer span to shorter in 1-way slab is- **1**
(a) Less than 1 (b) Greater than 1
(c) Less than 2 (d) Greater than 2

P.T.O.

vi. Distribution bars are provided in- **1**
(a) 1-Way Slab (b) 2 Way Slab
(c) Flat Slab Construction (d) Dome Slab

vii. Classification of columns as long or short depends upon- **1**
(a) Length
(b) Least lateral dimension
(c) Both (a) & (b)
(d) Shape

viii. Pitch of helix should not be less than- **1**
(a) 10 mm (b) 20 mm (c) 25mm (d) 40 mm

ix. The critical section in isolated footing for one way shear will be- **1**
(a) At d/2 distance from face of the column
(b) At face of the column
(c) At centre of the column
(d) At d distance from face of the column

x. The critical section in isolated footing for bending moment lies at- **1**
(a) At d/2 distance from face of the column
(b) At face of the column
(c) At centre of the column
(d) At d distance from face of the column

Q.2 i. Find the long term modulus of elasticity of reinforcement when creep coefficient is 1.2 and slope of stress strain curve is 261 GPa. **3**

ii. A rectangular RC beam of concrete grade M20 is 200 mm wide and 400 mm deep (effective depth) is provided with 6 nos. of 16 mm diameter bars find the stress in steel and concrete when beam is experienced a factored bending moment of 40kNm. (use Fy =415mPa) **7**

OR iii. Calculate the magnitude of uniformly distributed load which can be applied at quarter span from left support of a simply supported beam of clear span 6m with 550 mm depth and 250 mm width provided with 6 bars of 16 mm diameter use M20 and Fe415. **7**

Q.3 i. Write the steps involved in the shear design of RCC beam with all cases. **3**

ii. Design a beam for flexure and shear to support a UDL of 35 kN/m on 5 metre span supported over 200 mm wide supports use M-20 and Fe-415. **7**

OR iii. Design the beam for flexure to support a UDL of 25 kN/m on 5 metre of clear span when the overall depth of beam is restricted to 400 mm and it is supported over 250 mm wide supports in severe environmental condition. Use M-20 and Fe-415. **7**

Q.4 i. What do you mean by corner reinforcement? Write its significance and parametric value of corner reinforcement in different condition. **4**

ii. Design a slab of 8mx3m supported on its shorter span on 250 mm wide supports suppose to wear a load of 5 kN/m^2 use M-20 & Fe-415. **6**

OR iii. Design an interior panel of 4x3 floor system in which dimension of each slab is 4mx3m supported on 250 mm wide supports supposed to wear a load of 7 kN/m^2 use M-20 and Fe-415. **6**

Q.5 i. Write short note on- **3**
(a) Slenderness ratio (b) Effective length of column

ii. Design a concentric 5 meter long which is restrained against translation and rotation both at both end RC column subjected to 2000 kN under service load condition use M20 and Fe415. **7**

OR iii. Find the ratio of ultimate load carrying capacities of column with pure concentric condition to when minimum eccentricity is considered. (Size 400mmx400mm, and 4 nos. of 25 mm diameter reinforcement is provided. Use M20 and Fe415. **7**

Q.6 i. Define punching shear in isolated footings. **2**

ii. Find the design depth of footing for square column of size 450mmx450mm reinforced with 8 N of 25 mm diameter and carrying a service load of 2300 kN available bearing pressure is 300 kN/m^2 at a depth 1.5 m bellow the ground level use M20 and Fe415. **8**

iii. Find the length and width of combined footing has to support 2 columns of size 200mmx200mm and 300mmx300mm subjected to a factored load of 1000 and 1500 kN bearing capacity of soil is 250 kN/m^2 use M20 and Fe45 columns are 1.5 m apart and edge of lighter one is placed at 0.5 m from shorter edge of footing. **8**

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Scheme of Marking

MEDI-CAPS UNIVERSITY Knowledge Is Power	Faculty of Engineering End Sem (Odd) Examination Dec-2022 CE3CO12 RCC Design and Drawing Programme: B.Tech. | | Branch/Specialisation:

Note: The Paper Setter should provide the answer wise splitting of the marks in the scheme below.

Q.1	i)	(a)	**1**
	ii)	(b)	**1**
	iii)	~~(a)~~ (c)	**1**
	iv)	(c)	**1**
	v)	(d)	**1**
	vi)	(a)	**1**
	vii)	(c)	**1**
	viii)	(c)	**1**
	ix)	(d)	**1**
	x)	(b)	**1**
Q.2	i.	1 Mark for data identification and 2 Marks for formula and answer.	
	ii.	3 Marks for data identification 2 marks for finding stress in steel 2 marks for finding stress in concrete	
	iii.	3 Marks for data identification 4 marks for finding UDL	
Q.3	i.	3 Marks for all steps involved with all three cases	
	ii.	2 mark for data identification 1 mark for calculation of loads, depth and span 2 marks for check for moment 2 marks for Area of steel	
OR	iii.	1 mark for data identification 1 mark for calculation of loads, depth and span 1 marks for check for moment 1 marks for Area of steel 2 Marks for shear design 1 Mark for detailing	
Q.4	i.	2 marks for defining corner reinforcement 2 Marks for case dependent values	
	ii.	2 mark for data identification 1 mark for calculation of loads, depth and span and cover 1 marks for check for moment 2 marks for Area of steel	
OR	iii.	2 marks for data and case identification 1 mark for calculation of loads, depth and span and cover 1 marks for calculation and check for moment 2 marks for Area of steel	
Q.5	i.	1.5 Marks for defining each	
	ii.	2 marks for data and case identification 2 marks for calculation of effective length and slenderness ratio and eccentricity 3 marks for final design of reinforcement and detailing	
OR	iii.	2 marks for data and case identification 2 marks for calculation of effective length and slenderness ratio and eccentricity 3 marks for calculation of capacity and ratio	
Q.6	i.	2 Marks for proper definition	
	ii.	1 mark for data identification 1 mark for calculation of loads, depth and span 2 marks for check for one-way shear 1 marks for check for two-way shear 1 marks for check for moment 1 marks for Area of steel and depth 1 Mark for detailing	
	iii.	1 mark for data identification 1 mark for calculation of loads, depth and span 2 marks for check for resultant of forces 1 mark for arrangement of placement 3 marks for finding length and width and proper drawing	

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