

Total No. of Questions: 6

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Enrollment No.....



Faculty of Engineering
End Sem Examination Dec-2023

CE3ET02 Advanced Design of RCC Structures

Programme: B.Tech.

Branch/Specialisation: CE

Duration: 3 Hrs.

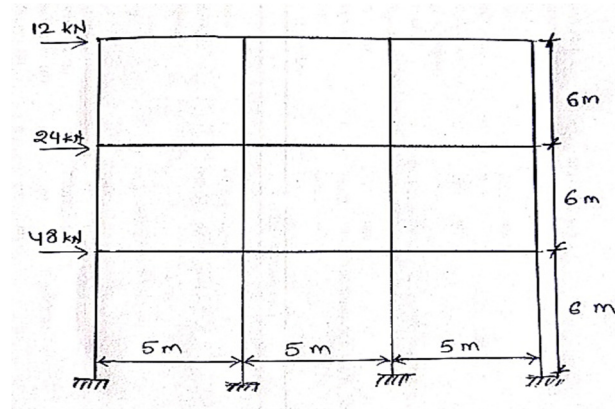
Maximum Marks: 60

- Note: 1. 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. Assume suitable data if necessary. Notations and symbols have their usual meaning.
2. IS code for relevant design is permitted.

- Q.1 i. Where is point of inflection located in top girder in a pin supported portal frame? **1**
(a) At one of the ends (b) At both ends
(c) At center of beam (d) Inflection point is not present
- ii. Shear wall having height to length ratio is less than 2 is called- **1**
(a) Double rise shear wall (b) Low rise shear wall
(c) High rise shear wall (d) Medium rise shear wall
- iii. In a cantilever retaining wall the maximum bending moment in the stem will be at- **1**
(a) Top (b) Base
(c) Centre (d) 2/3 from the top
- iv. Width of counter fort is- **1**
(a) 0.03H to 0.06H (b) 0.06H to 0.09H
(c) 0.09 H to 1.1 H (d) 1.1H to 1.3 H
- v. What do you mean by Free Board in water tank design? **1**
(a) Extra R/f (b) Extra Stirrups
(c) Extra Space for Storage (d) Extra Base Slab
- vi. Minimum clear cover required for the design of water tank. **1**
(a) 20 mm (b) 25 mm (c) 50 mm (d) 10 mm
- vii. Deep bins are- **1**
(a) Bunker (b) Silo
(c) Both (a) and (b) (d) None of these

- viii. A vertical wall of a circular bunker subjected to horizontal pressure due to coal stored in it the wall is designed for- **1**
 (a) Bending moment
 (b) Shear force
 (c) Hoop tension and bending moment
 (d) All of these
- ix. What is prestress concrete? **1**
 (a) Strengthening a material by the application of stress during packaging
 (b) Strengthening a material by the application of stress during manufacture
 (c) Smoothing a material by the application of stress during manufacture
 (d) None of these
- x. The soffit of the beam after the transfer of prestress to concrete will be under _____. **1**
 (a) Bondage (b) Breakage
 (c) Compression (d) Tension

- Q.2 i. Define shear wall. **2**
 ii. Explain various load combination for building frame. **3**
 iii. Write down assumptions of substitute frame method and portal frame method. **5**
- OR iv. Analysis the frame using cantilever method. **5**



- Q.3 i. Explain types of retaining wall. **2**

- ii. Design a cantilever retaining wall (i.e. T-type) to retain earth for a height of 4m. The backfill is horizontal. The density of soil is 18 kN/m^3 . Safe bearing capacity of soil is 200 kN/m^2 . Take the coefficient of friction between concrete and soil as 0.6. The angle of repose of earth is 30° . Use M20 concrete and Fe500 steel. **8**
- OR iii. Write down design steps of toe slab and heel slab of cantilever retaining wall. **8**
- Q.4 i. What are types of water tank? **3**
 ii. List out component of intze water tank with diagram. **7**
- OR iii. Write down the design steps of circular water tank. **7**
- Q.5 i. What do you mean by bunker and silo? **4**
 ii. Write down difference between bunker and silo. **6**
- OR iii. Explain design steps of silo by Janseen's theory. **6**
- Q.6 Attempt any two: **5**
 i. Explain the principles of prestressed design of concrete structures. **5**
 ii. Explain different methods of prestressing. **5**
 iii. Explain working and limit state design of prestressed concrete member. **5**

Marking Scheme

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Q.1	i)	C	1
	ii)	B	1
	iii)	A	1
	iv)	A	1
	v)	C	1
	vi)	B	1
	vii)	B	1
	viii)	C	1
	ix)	B	1
	x)	C	1

Q.2	i.	For correct Definition of Shear Wall give	2 marks
	ii.	For Explaining various load combination for building frame give	3 marks
	iii.	For each assumptions of substitute frame method and portal frame method give 1 marks	
OR	iv.	For each floor beams shear force and bending moment give	2.5 marks and
		for each floor column shear force and bending moment give	2.5 marks

Q.3	i.	For each types of retaining wall give	1 marks
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	ii.	For correct design upto stem give	2 marks for each step
OR	iii.	For each design steps of toe slab give	4 marks
		and for heel slab give	4 marks
Q.4	i.	For each types of Water tank give	1 marks
	ii.	For component of intze water tank give	6 marks
		and for diagram	1 marks
OR	iii.	For each design steps of design of underground rectangular tank give	2 marks
Q.5	i.	For correct definition of Bunker and Silo give	2 marks each
	ii.	For each difference give	1 marks
OR	iii.	For each design steps of silo by Janseen's theory give	1 marks
Q.6	i.	For each principles of prestressed design of concrete structures give	1 marks
	ii.	For each methods of prestressing give	1 marks
	iii.	For Explaining working method give	2.5 marks
		and for limit state design give	2.5 marks
