

SE / Civil / Sem III / NEP 25 / BM CT / SH-25

Time: 2 Hours

Maximum Marks: 60

Notes:

- i. Question No. 1 is compulsory.
- ii. Attempt any three out of remaining 5 Questions.
- iii. Figures to the right indicate full marks.
- iv. Assume suitable data if required.

Q.P. 10095023

- Q.1 Attempt any **FIVE** of the following
- | | |
|--|---|
| a. Enlist the Properties of Glass | 3 |
| b. What is termite proofing? Mention any two methods used. | 3 |
| c. Enlist the Physical Properties of OPC as per IS Code | 3 |
| d. Classify The concrete according to Their Grade | 3 |
| e. Explain why curing for concrete is important. Explain with example. | 3 |
| f. What are the Objective in Concrete Mix Design | 3 |
| g. Enlist the limitation of NDT | 3 |
- Q.2 Attempt the following
- | | |
|---|---|
| a. Define Admixture and state different function of it | 5 |
| b. Draw neat labelled sketch of c/s of timber | 5 |
| c. Enlist different method of workability. Explain any one in details | 5 |
- Q.3 Attempt the following
- | | |
|--|---|
| a. State & explain Duff Abram's W/C ratio | 5 |
| b. Explain Seasoning of Stone | 5 |
| c. Explain Manufacturing process of Burnt Clay Brick | 5 |
- Q.4 Attempt the following
- | | |
|---|----|
| a. Prepare Mix deign for M25 grade as Per IS 10262 for reinforced concrete with following parameters: | 12 |
| Type of Cement: OPC 53 | |
| Max nominal size of aggregate: 20 mm | |
| Exposure condition: Moderate | |
| Workability of concrete: 75 mm | |
| Admixture: Superplasticizers (1 % of Cement) | |
| Sp. Gravity of Cement: 3.15 | |
| Sp. Gravity of Superplasticizers: 1.1 | |
| Sp. Gravity of Coarse Aggregate: 2.6 | |
| Sp. Gravity of Zone II Fine Aggregate: 2.65 | |
| Adopt W/C ratio: 0.4 | |
| b. State different methods used in curing of concrete | 3 |
- Q.5 Attempt the following
- | | |
|--|---|
| a. Draw Layout of Ready Mixed Concrete | 5 |
| b. Write short note on Hot water Concreting. | 5 |
| c. Explain Alkali aggregate reaction | 5 |
- Q.6 Attempt the following
- | | |
|--|---|
| a. State Properties of Concrete in Fresh and Hardened state. | 5 |
| b. Differentiate between Volume batching and Weight batching | 5 |
| c. Explain Rebound Hammer test in Case of NDT on concrete | 5 |

Data for Q.4 (a)

Table 1 Value of X
(Clause 4.2)

Sl No. (1)	Grade of Concrete (2)	Value of X (3)
i)	M10	5.0
	M15	
ii)	M20	5.5
	M25	
iii)	M30	6.5
	M35	
	M40	
	M45	
	M50	
	M55	
iv)	M60	8.0
	M65 and above	

Table 2 Assumed Standard Deviation
(Clause 4.2.1.3)

Sl No. (1)	Grade of Concrete (2)	Assumed Standard Deviation N/mm ² (3)
i)	M10	3.5
	M15	
ii)	M20	4.0
	M25	
iii)	M30	5.0
	M35	
	M40	
	M45	
	M50	
	M55	
iv)	M60	6.0
	M65	
	M70	
	M75	
	M80	

Table 3 Approximate Air Content
(Clause 5.2)

Sl No. (1)	Nominal Maximum Size of Aggregate mm (2)	Entrapped Air, as Percentage of Volume of Concrete (3)
i)	10	1.5
ii)	20	1.0
iii)	40	0.8

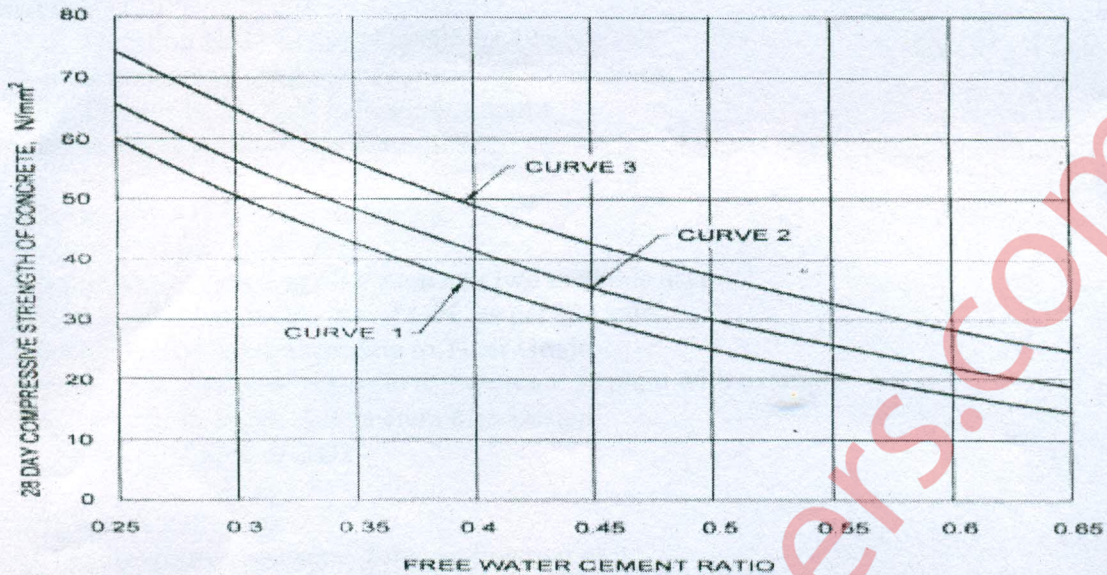
Table 4 Water Content per Cubic Metre of Concrete For Nominal Maximum Size of Aggregate
(Clause 5.3)

Sl No. (1)	Nominal Maximum Size of Aggregate mm (2)	Water Content ¹⁾ kg (3)
i)	10	208
ii)	20	186
iii)	40	165

Table 5 Volume of Coarse Aggregate per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate for Water-Cement/Water-Cementitious Materials Ratio of 0.50
(Clause 5.5)

Sl No. (1)	Nominal Maximum Size of Aggregate mm (2)	Volume of Coarse Aggregate per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate			
		Zone IV (3)	Zone III (4)	Zone II (5)	Zone I (6)
i)	10	0.54	0.52	0.50	0.48
ii)	20	0.66	0.64	0.62	0.60
iii)	40	0.73	0.72	0.71	0.69

IS 10262 : 2019



Curve 1 : for expected 28 days compressive strength of 33 and < 43 N/mm²
 Curve 2 : for expected 28 days compressive strength of 43 and < 53 N/mm²
 Curve 3 : for expected 28 days compressive strength of 53 N/mm² and above.

Table 5 Minimum Cement Content, Maximum Water-Cement Ratio and Minimum Grade of Concrete for Different Exposures with Normal Weight Aggregates of 20 mm Nominal Maximum Size

(Clauses 6.1.2, 8.2.4.1 and 9.1.2)

Sl No.	Exposure	Plain Concrete			Reinforced Concrete		
		Minimum Cement Content kg/m ³	Maximum Free Water-Cement Ratio	Minimum Grade of Concrete	Minimum Cement Content kg/m ³	Maximum Free Water-Cement Ratio	Minimum Grade of Concrete
1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	Mild	220	0.60	-	300	0.55	M 20
ii)	Moderate	240	0.60	M 15	300	0.50	M 25
iii)	Severe	250	0.50	M 20	320	0.45	M 30
iv)	Very severe	260	0.45	M 20	340	0.45	M 35
v)	Extreme	280	0.40	M 25	360	0.40	M 40