



Sanjay Ghodawat University, Kolhapur

2018-19

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017

EXM/P/09/01

Year and Program: 2018-19

School of Technology

Department of Civil Engineering

Course Code: CET206

Course Title: Concrete
Technology

Semester – III

Day and Date

Saturday
15-06-2019

End Semester Examination
(ESE)

Time: Max Marks: 100

3 hrs 2:30 to 5:30 pm

Instructions:

- 1) All questions are compulsory.
- 2) Assume suitable data wherever necessary.
- 3) Figures to the right indicate full marks.

Q.1	Solve any Two	Marks	Bloom's Level	CO
a)	Enlist the physical properties of cement. Explain setting time of cement with neat sketch.	07	L ₃	CO1
	OR			
a)	Explain heat of hydration and its importance in setting.	07	L ₃	CO1
b)	What are the objectives of curing of concrete? Explain the different methods of curing of concrete	08		CO2
	OR			
b)	Explain use of fly ash and metakaolin in fresh concrete with their Advantages.	08	L ₃	CO2
Q.2	Solve any Two			
a)	Explain characteristic strength, compressive strength and flexural strength on concrete.	07	L ₁	CO3
	OR			
a)	List the various factors affecting the strength of concrete? Describe gel space ratio.	07	L ₁	CO3
b)	Explain the importance of minimum & maximum cement content on durability?	08	L ₃	CO4
	OR			
b)	What is durability of concrete? Enlist factors affecting durability of concrete. Explain any one in detail	08	L ₃	CO4
Q.3	Solve any Two			
a)	Define aggregate and classify them according to i) size (ii) Shape (iii) source of origin and (iv) Weight criteria	08	L ₂	CO1

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|----|--|----|----------------|-----|
| b) | Explain placing of concrete and describe the different method of placing of concrete. | 08 | L ₂ | CO2 |
| c) | What is creep and shrinkage of concrete? List the factors affecting creep and shrinkage of concrete. | 08 | L ₂ | CO3 |
| d) | What is non-destructive testing of concrete? Explain Rebound Hammer. | 08 | L ₂ | CO4 |

Q.4 Write short notes on (any Three)

- | | | | | |
|----|----------------------------|----|----------------|-----|
| a) | Cold Weather Concreting | 06 | L ₃ | CO5 |
| b) | Fiber Reinforced Concrete. | 06 | L ₃ | CO5 |
| c) | Ferrocement | 06 | L ₃ | CO5 |
| d) | Self Compacting Concrete | 06 | L ₃ | CO5 |

Q.5 Solve any One

- | | | | | |
|----|--|----|----------------|-----|
| a) | Design a concrete mix for M20 grade of concrete for severe exposure condition for RCC work as per IS: 10262-2007 for 1 bag of cement for the following data.
Maximum size of aggregate (Angular): 20 mm
Specific gravity of Cement: 3.10
Specific gravity of Fine Aggregate: 2.8
Specific gravity of coarse aggregate: 2.95
Water Absorption of Fine Aggregate: Nil
Water Absorption of Coarse aggregate: 0.50 %
Free surface moisture on Fine Aggregate: 1%
Compaction Factor: 0.85 Targeted Slump: 50 mm
Sand Zone: II
Take standard deviation: 5 and Tolerance factor: 1.65 | 18 | L ₄ | CO6 |
|----|--|----|----------------|-----|

Use the table given below for reference

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|----|---|----|----------------|-----|
| b) | Design a concrete mix for M30 grade of concrete for severe exposure condition for RCC work as per IS: 10262-2007 for 1 bag of cement for the following data.
Maximum size of aggregate (Angular): 20mm
Water-Cement ratio: 0.48
Specific gravity of cement: 3.10
Specific gravity of Fine Aggregate: 2.6
Specific gravity of coarse aggregate: 2.65
Water Absorption of Fine Aggregate: Nil
Water Absorption of Coarse aggregate: 0.50 % | 18 | L ₄ | CO6 |
|----|---|----|----------------|-----|

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Free surface moisture on Fine Aggregate: 1%

Compaction Factor: 0.85 Targeted Slump: 50mm

Sand Zone: III

Take standard deviation: 5 and Tolerance Factor: 1.65

Use the table given below for reference

Table No. 2 Maximum Water Content per Cubic Meter of Concrete for Nominal Maximum Size of Aggregate		
Sr. No.	Nominal Maximum Size of Aggregate	Maximum Water Content kg/m ³
1	10	208
2	20	189
3	40	165

Table No. 3 Volume of Coarse Aggregate per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate					
Sr.No.	Nominal Size of Aggregate	Zone IV	Zone III	Zone II	Zone I
1	10	0.50	0.48	0.46	0.44
2	20	0.66	0.64	0.62	0.60
3	40	0.75	0.73	0.71	0.69

Table No. 4 Minimum Cement content and Maximum W/C ratio for 20 MSA (IS-456-2000)

Sr.No.	Exposure	Reinforced Concrete		
		Minimum Cement Content kg/m ³	Maximum free W/C ratio	Minimum Grade of Concrete
1	Mild	300	0.55	M20
2	Moderate	300	0.50	M25
3	Severe	320	0.45	M30
4	Very Severe	340	0.45	M35
5	Extreme	360	0.40	M40

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Q.6 Explain the term (any Three)

a) High Density Concrete

06 L₂ CO5

b) No fine Concrete.

06 L₂ CO5

c) Explain objective of mix design

06 L₂ CO6

d) List out different methods of mix design and explain any one.

06 L₂ CO6

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