Sanjay Ghodawat University, Kolhapur
Established as State Private University under Govt. of Maharashtra. Act No XL, 2017
2019-20
EXM/P/09/01

**Year and Program: 2018-19** | **School of Technology** | **Department of Civil Engineering (Construction Engg. & Mangt)**

**Course Code: CEM503 R1** | **Course Title: Concrete Processes** | **Semester – I**

**Day and Date:** Friday 20/12/19 | **End Semester Examination (ESE)** | **Time:** 3hr **Max Marks: 100** 10.30am to 1.30 pm.

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

| | | Marks | Bloom's Level | CO |
|---|---|---|---|---|
| Q.1 | **Solve the following.** | | | |
| a) | Elaborate correlation between normal probability distribution and standard deviation with concrete mix proportioning. | 07 | L5 | CO1 |
| | OR | | | |
| a) | Find out volume of different ingredients of concrete of grade M-45 by IS method. Assume suitable data. | 07 | L5 | CO1 |
| b) | Differentiate DOE and ACI method of concrete mix design. Also explain role of standard deviation in both methods? | 08 | L4 | CO1 |
| | OR | | | |
| b) | Elaborate acceptance criteria for test results of concrete mix design as per IS 456-2000. | 08 | L4 | CO1 |
| Q.2 | **Solve the following.** | | | |
| a) | Explain different challenges encountered in batching and mixing of concrete in cold weather. What are latest techniques to overcome the challenges? | 07 | $L_3$ | CO2 |
| | OR | | | |
| a) | Explain in details challenges encountered in placing and compaction of concrete in cold weather. . What are techniques to overcome the challenges? | 07 | $L_3$ | CO2 |
| b) | Elaborate challenges encountered in transportation of concrete for long distances in hot weather. What are latest techniques to overcome the challenges? | 08 | $L_3$ | CO2 |
| | OR | | | |
| b) | Elaborate special precautions to be taken during mass concreting for large concrete dams. | 08 | $L_3$ | CO2 |



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| Q.3 | | **Solve any Two** | | | |
| | a) | Explain the following:<br>1) Types of deterioration of concrete structures in coastal region<br>2) Mechanism of deterioration of concrete structures. | 08 | L3 | CO3 |
| | b) | Explain the following terms:<br>1) Microstructure of highly permeable concrete.<br>2) Parameters governing durable concrete. | 08 | L3 | CO3 |
| | c) | Explain the following:<br>1) Signs, Causes and symptoms of deteriorated concrete.<br>2) Deterioration due to moisture, temperature and shrinkage. | 08 | L3 | CO3 |
| | d) | Explain the following:<br>1) Chemical deterioration due to chloride and sulphate attack.<br>2) Deterioration due to acid attack and alkali-silica reaction | 08 | L3 | CO3 |
| Q.4 | | **Solve any Two** | | | |
| | a) | Concrete exposed to marine environment | 09 | L3 | CO3 |
| | b) | Concreting for road pavement. | 09 | L3 | CO3 |
| | c) | Tremix concrete flooring. | 09 | L3 | CO3 |
| Q.5 | | **Solve any Two** | | | |
| | a) | What are different methods used for identifying distress in concrete structures. Explain method for maintenance of bridge deck. | 09 | L4 | CO4 |
| | b) | Roll of NDT equipments in structural auditing. | 09 | L4 | CO4 |
| | c) | Roll of laboratory test methods in evaluating structural strength. | 09 | L4 | CO4 |
| Q.6 | | **Solve any Three** | | | |
| | a) | Damage assessment of structural elements. | 06 | L5 | CO4 |
| | b) | Performance criteria for durable concrete repairs. | 06 | L5 | CO4 |
| | c) | Different materials used for retrofitting of concrete structures? | 06 | L5 | CO4 |
| | d) | Explain different methods to identify invisible distress in concrete structures. | 06 | L5 | CO4 |

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