

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular), April-May 2016

B. Tech in Civil Engineering, Semester IV

Roll No.....

CE402 : Concrete and Construction Technology

Time: 3 hours

Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

Q.1A Objective type multiple choice questions (10 questions @ 1 mark) 10

- i. In Non-Destructive Testing of Concrete by Ultrasonic Pulse Velocity Method, if the Pulse Velocity by Cross Probing is between 3.0 to 3.5 Km/S than Quality Grading of concrete will be:
(a)Excellent
(b)Good
(c)Medium
(d)Doubtful
(e)None of these
- ii. In Le-chatelier test to determine the soundness of OPC, the maximum value of expansion in mm (as per IS:269-1989) should not be greater than:
(a) 5 mm
(b) 10 mm
(c) 25 mm
(d) 20 mm
- iii. Rate of corrosion of structural steel reinforcement controlled by :
(a) Anodic Reactions
(b) Cathodic Reactions
(c) Both of above
(d) None of these
- iv. Minimum cement content required to overfill the voids of rounded gravel aggregates :
(a) 450 Kg/m³
(b) 600 Kg/m³
(c) 300 Kg/m³
(d) 350 Kg/m³
- v. The rebound hammer method could be used for :
(a) Assessing the compressive strength of concrete with the help of suitable correlations between rebound index and compressive strength
(b) Assessing the uniformity of the concrete
(c) Assessing the quality of concrete in relation to the standard requirements
(d) All of these
(e) None of these



- vi Specific gravity of Portland cement is about:
 - (a) 1.2
 - (b) 5.76
 - (c) 8.3
 - (d) 3.15
- vii Methyl cellulose can be used as :
 - (a) Bonding Admixture
 - (b) Grouting Admixture
 - (c) Gas forming Admixture
 - (d) Shrinkage reducing Admixture
- viii In cement manufacturing, the decomposition of lime stone takes place in :
 - (a) Upper part of rotary kiln
 - (b) Central part of rotary kiln
 - (c) Lower part of rotary kiln
 - (d) Doesn't takes place in rotary kiln

ix Leached out lime + Atm $\text{CO}_2 \longrightarrow \text{CaCO}_3$ (White residue on the concrete surface) (During leaching of concrete)



This is known as of concrete

x The mechanisms and involves in the action of plasticizer that helps to improve the workability of concrete.

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| Q.2 | Short answer type questions (4 questions @ 2.5 marks)
Write short note on the following :
i. Vee- Bee time
ii. Microwave water content test | 10 |
| Q.3A | Describe the deformation phenomenon in concrete when a contraction suffered by concrete in the absence of load. | 05 |
| Q.3B | Explain the process of Hydration of Portland cement and also explain how the dense network of hydration compound is created with the help of simple flow chart of hydration? | 05 |
| Q.4A | Classify and explain the Deleterious material present in concrete with example whose presence adversely affect the strength , workability and long term performance of concrete. | 05 |
| Q.4B | Explain the phenomenon of Shrinkage and temperature effect over the concrete and also analyze the variation of shrinkage and moisture movement in the concrete with alternate drying and wetting. | 05 |
| Q.5A | Write short note on the following physical properties of Portland cement:
i. Fineness
ii. Soundness | 05 |
| Q.5B | Describe the mechanisms behind the deterioration of concrete. | 05 |

- Q.6A If you observe brown staining in concrete around the steel accompanied by cracking than explain the possible mechanism behind this observation. 05
- Q.6B Explain the effect of Reinforcement corrosion on structural behaviour of concrete. 05
- OR
- Q.6B Write short note on the following properties of aggregates: 05
(i) Fineness Modulus
(ii) Resistance to crushing
- Q.7A Explain in detail the basic properties of cement compounds with its graph showing variation in compressive strength due to each compound with days. 05
- Q.7B Write short note on the following : 05
i. Slump test
ii Compaction Factor test
- OR
- Q.7B Write detail explanatory note on Repair of concrete with the help of following subheadings : 05
i. objectives of selected repairing procedures
ii. Defects during construction and Prevention
- Q.8A Explain the following w.r.t. Reinforcement corrosion : 10
i. Causes of Reinforcement corrosion
ii. Control of Reinforcement corrosion
- Q.9A What do you mean by NDT Techniques? Explain the following Non Destructive Tests for Concrete: 10
i. Surface Hardness Tests – Rebound Hammer Test
ii. Ultrasonic Pulse Velocity Test
- Q.9B Define admixtures and explain in detail the “General Purpose Admixtures” with its function, mechanism of action and appropriate examples. 10
- OR
- Q.9B Explain in detail the steps of cement manufacturing process, along with block diagram showing process and process equipment. 10

