

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular), April-May 2015

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. Which cement compound provide more resistance to chemical attack:
(a) C_3S
(b) C_2S
(c) C_3AF
(d) C_3A
- ii. In ultrasonic test for hardened concrete the pulse velocity and frequency ranges from:
(a) $v = 5$ to 7 km/s & $\nu = 200$ to 300 KHz
(b) $v = 1$ to 3 km/s & $\nu = 10$ to 15 KHz
(c) $v = 8$ to 9 km/s & $\nu = 220$ to 375 KHz
(d) $v = 3$ to 5 km/s & $\nu = 15$ to 175 KHz
- iii. If you observed cracks in horizontal surface of hardened concrete, than possible reasons for cracking are :
(a) Plastic shrinkage
(b) Rapid drying of concrete surface
(c) Both of above
(d) None of these
- iv. Rate of corrosion of structural steel reinforcement controlled by :
(a) Anodic Reactions
(b) Cathodic Reactions
(c) Both of above
(d) None of these
- v. Identify the High Range Water Reducer (HRWR) or super plasticizers :
(a) Modified lingo-sulphonates.
(b) Sugar
(c) Starch
(d) Hydroxide of Zn and Pb

vi	Minimum cement content required to overfill the voids of crushed rock aggregates : (a) 400 Kg/m ³ (b) 600 Kg/m ³ (c) 300 Kg/m ³ (d) 350 Kg/m ³	
vii.	Negative numerical value of shrinkage strain indicates : (a) Drying of concrete (b) Swelling of concrete (c) Sometimes drying and sometimes swelling (d) None of these	
viii.	The standard consistency of a cement paste may be defined as that consistency which will permit a Vicat plunger having 10 mm diameter and 50 mm length to penetrate from the top of the mould to a depth of : (a) 23-25 mm (b) 33-35 mm (c) 43-53 mm (d) 13-23 mm	
ix.	Specific gravity of Portland cement is about: (a) 1.2 (b) 5.76 (c) 8.3 (d) 3.15	
x.	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	
Q.2	Short answer type questions (4 questions @ 2.5 marks) Write short note on the following w.r.t. properties of aggregates: (a) Particle shape and texture (b) Resistance to crushing (c) Bulk Density of Aggregate (d) Flaky and elongated aggregate	10
Q.3A	Write the oxide composition of OPC.	05
Q.3B	Explain the basic properties of cement compound.	05
Q.4A	Explain the shrinkage and temperature effects over a concrete specimen also analyze the variation of shrinkage and moisture movement in the concrete with alternate drying and wetting.	05
Q.4B	Justify the durability of concrete subjected to marine environment.	05



Q.5A	Explain the phenomenon of "Hydration of cement".	05
Q.5B	How will you measure the property of freshly mixed concrete or mortar which determines the ease and homogeneity with which it can be mixed placed, compacted and finished.	05
Q.6A	Write short note on the following w.r.t. fresh concrete : i. Segregation ii. Bleeding	05
Q.6B	Define the term "Rheology "and describe the parameters defining Rheology of fresh concrete.	05
OR		
Q.6B	How do you prevent the concrete from deterioration?	05
Q.7A	Explain any five defects during construction with the following subheadings: i. Symptoms ii. Causes iii. Prevention and Remedy	05
Q.7B	Classify the aggregates according to shape of aggregates.	05
OR		
Q.7B	Classify the aggregates according to size of aggregates.	05
Q.8A	Describe the following physical properties of Portland cement: i. Fineness ii. Soundness iii. Compressive strength iv. Heat of hydration	10
Q.9A	What do you mean by NDT Techniques? Explain in detail any two such techniques used in concrete analysis.	10
Q.9B	Explain the following w.r.t. Reinforcement corrosion : i. Effect of reinforcement corrosion on structural behaviour. ii. Causes of Reinforcement corrosion iii. Control of Reinforcement corrosion	10 (3+4+3)
OR		
Q.9B	Define admixtures and explain in detail the "General Purpose Admixtures" with its function, mechanism of action and appropriate examples.	10