

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular), April-May 2018

B. Tech in Civil Engineering, Semester IV

Roll No.....

CE409: CONCRETE 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. For given water content, workability decreases if the concrete aggregates contain an excess of:
 - (a) thin particles
 - (b) flat particles
 - (c) elongated particles
 - (d) All the above.
- ii. After casting, an ordinary cement concrete on drying:
 - (a) expands
 - (b) mix
 - (c) shrinks
 - (d) none of these
- iii. For road pavements, the cement generally used, is:
 - (a) ordinary Portland cement
 - (b) rapid hardening cement
 - (c) low heat cement
 - (d) blast furnace slag cement
- iv. Addition of pozzolana to ordinary port land cement, causes:
 - (a) decrease in early strength
 - (b) reduction in chemical action with sulphates
 - (c) reduction bleeding
 - (d) All the above.
- v. Pick up the incorrect statement from the following:
 - (a) The degree of grinding of cement, is called fineness
 - (b) The process of changing cement paste into hard mass, is known as setting of cement
 - (c) The phenomenon by virtue of which cement does not allow transmission of sound, is known as soundness of cement
 - (d) The heat generated during chemical reaction of cement with water, is known as heat of hydration
- vi. Efflorescence in cement is caused due to an excess of:
 - (a) alumina
 - (b) iron oxide

	(c) silica (d) alkalis	
vii.	An ordinary Portland cement when tested for its fineness, should not leave any residue on I.S. sieve No. 9, more than: (a) 5% (b) 10% (c) 15% (d) 20%	
viii.	The entrained air in concrete: (a) increases workability (b) decreases workability (c) decreases resistance to weathering (d) increases strength	
ix.	The type of aggregates not suitable for high strength concrete and for pavements subjected to tension, is: (a) rounded aggregate (b) irregular aggregate (c) angular aggregate (d) flaky aggregate	
x.	Le-Chatelier's apparatus is used for testing: (a) soundness of cement (b) hardness of cement (c) strength of cement (d) Durability of cement.	

Q.2	Short answer type questions (4 questions @ 2.5 marks) Write short note on the following: i. Compacting factor ii. Swelling of concrete Differentiate between the following : i. Segregation & Bleeding ii. Compliance testing & Secondary Testing	10
Q.3A	Define the term "Bulking of aggregates". Explain its significance with reference to concrete making. Explain the simple field test to determine the bulking of aggregates.	05
Q.3B	Enlist the tests which are commonly employed to measure the workability of concrete. Describe any one of these.	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	What is fineness modulus? Explain the method of determining fineness modulus along with its significance in making good concrete?	05
Q.5A	Discuss briefly the electrochemical corrosion of reinforcement embedded in	05

	concrete.	
Q.5B	Define the corrosion of concrete. State the types of deterioration and explain in detail the deterioration mechanism of concrete.	05
Q.6A	Explain the following terms w.r.t. hardened concrete : i. Bingham Model ii. Stress-Strain characteristics curve of hardened concrete	05
Q.6B	"Extent of hydration of cement and resultant microstructure of hydrated cement influences the physical properties of cement/concrete" Justify the statement.	05
	OR	
Q.6B	Define admixtures and enlist its functions. Explain in detail about the Plasticizers with its function, mechanism of action and appropriate examples.	05
Q.7A	Workability, a complex property of fresh concrete depends on two critical parameters. Explain in detail those parameters.	05
Q.7B	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
	OR	
Q.7B	Write the chemical composition of OPC along with its oxide composition.	05
Q.8A	Enlist the major defects occurring during the construction. Write in tabular form the symptoms, cause, prevention and remedy of these defects for the repair of concrete structures.	10
Q.9A	Explain briefly the effect of Reinforcement corrosion on structural behavior of concrete. Discuss the principle reasons of Reinforcement corrosion and also control of reinforcement corrosion	10
Q.9B	Discuss the following in detail with neat sketch: i. Wet process of manufacture of ordinary cement ii. Ultrasonic Pulse Velocity Test	10
	OR	
Q.9B	Explain the following w.r.t. Lightweight concrete: i. Discuss the significant difference between mixture proportioning of normal weight and light weight concrete. ii. Why is lightweight concrete preferred for construction particulars in multi-story building? Explain with respect to their physical characteristics of lightweight aggregate concrete.	10