GANPAT UNIVERSITY

B.Tech.4th. Semester (CIVIL), Regular (CBCS) Examination : May-June : 201

2CI 406 : Concrete Technology

Max.Time: 3 Hours Max. Marks: 70

Exam. No. of the candidate: _____ Supervisor's dated initial: _____

Instructions: - (1) Answer to the two sections must be written in separate answer books.

(2) Figures to the right indicate full marks.

(3) Assume suitable data if required.

Section - I

1 (A) Enlist the data required for mix design material data. (04)

OR

1 (A) Compression between IS, ACI and DOE method for concrete mix design. (04)

2 Attempt any Three : (15)

(A) Explain Water Requirement for Hydration.

(B) What is importance of compaction of concrete?

(C) Write a short note on : Ultrasonic Plus Velocity Test

(D) Write a short note on : Gap Grading

(E) Discuss bleeding of concrete and Enlist the remedies to bleeding.

3 Attempt any four : (16)

(A) Sulpate Attack on Concrete

(B) Describe the Bogue's Chemical compounds composition of Portland cement.

3 (C) Reported waste utilization till the date in concrete

(D) Define curing, state different methods of curing Describe any one method.

(E) State factors affecting compressive strength of concrete and explain any one.

Section - II

4 Attempt any Three: (18)

(A) Define durability of concrete and explain factor affecting it.

(B) Explain Aggregate Abrasion Value Test

(C) What is admixture? Enlist at least five admixtures with their use.

(D) Differentiate between:

(1) fresh concrete and hardened concrete

(2) Coarse aggregate and Fine aggregate

(E) Explain slump test for the measurement of workability of concrete.

5 Design a concrete mix (as per IS: 10262-2009) for a reinforced concrete work which will be exposed to the moderate condition. The concrete mix is to be designed as below data. (17)

(a)Stipulations for proportioning :

1. Grade of designation: M 25
2. Types of cement : OPC 53 grade
3. Use waste from the Essar Steel Ltd : Fes Dust (Use 25% of total cementitious material content)
4. Maximum nominal size of aggregate : 20 mm
5. Minimum cement content: 300 kg/m^3 (As per IS :456 – 2000 ,Table -5)
6. Maximum water-cement ratio: 0.50(As per IS :456 – 2000 ,Table -5)
7. Method of concrete placing: Manual

8. Degree of supervision: Good

9. Type of aggregate: Crushed angular aggregate

10. Maximum cement content: 450 kg/ m^3

11. Chemical admixture type: Superplasticiser (Use 1% of total cementitious material content)

12. Exposure condition : Moderate (for reinforced concrete)

(b)Test data of materials (As per IS) :

1. Specific gravity of: Coarse aggregate: 2.70, Fine aggregate: 2.67, Cement: 3.15,Chemical admixture: 1.145 and Mineral admixture: 2.2
2. Water absorption (IS 2386:1963) : (I) Coarse aggregate: 0.5% and (II) Fine aggregate: 1.0 %
3. Free (surface) moisture: (I) Coarse aggregate: Nil (absorbed moisture also nil) (II) Fine aggregate: Nil
4. Sieve analysis (IS 2386 Part 1): (I) Coarse aggregate: (Conforming to Table 2 of IS 383) and (II) Fine aggregate: Conforming to grading Zone I of below table of IS 383:1970 (Reaff. 2007)
5. Stander derivation = 4 N/mm^2
6. From Table 2 of IS 10262 – 2009 = 186 kg (for 25 to 50 mm slump range) for 20 mm aggregate.
7. From Table 3 of IS 10262 - 2009 volume of coarse aggregate corresponding to 20 mm size aggregate and fine aggregate (Zone I) for water-cement ratio of 0.50 = 0.60.

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