

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-IV (NEW) EXAMINATION – SUMMER 2024

Subject Code:3144004

Date:18-07-2024

Subject Name: Concrete Technology

Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.
5. Use of IS 10262:2019 is allowed. (w/o annexure)

MARKS

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|-----|-----|---|----|
| Q.1 | (a) | Define hydration of cement. | 03 |
| | (b) | Explain factors effecting setting time of cement. | 04 |
| | (c) | What are Bouge's compounds? Explain in detail how each one of these compounds influences the strength and setting properties of cement. | 07 |
| Q.2 | (a) | Explain role of admixture in manufacturing of the concrete. | 03 |
| | (b) | Differentiate between gap grading and well grading of aggregates | 04 |
| | (c) | Define soundness of cement. Explain test for calculating soundness of cement. | 07 |
| | | OR | |
| | (c) | Enlist the test performed on fresh concrete specimen. Explain any one in detail. | 07 |
| Q.3 | (a) | Define workability. Enlist various method to access workability of concrete. | 03 |
| | (b) | Explain how impurities in water can affect on concrete? | 04 |
| | (c) | Discuss classification of shrinkage observed in concrete and explain each one of them briefly? | 07 |
| | | OR | |
| Q.3 | (a) | Define (i) Segregation (ii) Bleeding (iii) Consistency | 03 |
| | (b) | What are site preparations required before starting pumped concreting work? | 04 |
| | (c) | Explain different methods of curing procedure. | 07 |
| Q.4 | (a) | Enumerate different mechanical properties of concrete | 03 |
| | (b) | Discuss alkali-aggregate reaction in detail. | 04 |
| | (c) | Explain Creep of concrete and relation between creep and time. | 07 |
| | | OR | |
| Q.4 | (a) | Explain the maturity concept for strength development of concrete. | 03 |
| | (b) | Write short note on 'Sulphate attack on concrete' | 04 |
| | (c) | State and explain factors affecting permeability of concrete. What measures should be taken to reduce permeability of concrete? | 07 |
| Q.5 | (a) | Enlist factors influencing Mix Design of Concrete. | 03 |
| | (b) | How will you carry out concreting work on construction site in summer, if project site located in Chennai? | 04 |

- (c) Design a M40 concrete mix using IS method of Mix Design for the following data: **07**
- 1) Maximum size of aggregate - 20mm (Angular).
 - 2) Degree of workability - 0.90 compaction factor.
 - 3) Quality control - good
 - 4) Type of exposure - severe
 - 5) Specific Gravity:
 - A. Cement - 3.15
 - B. Sand - 2.68
 - C. Coarse aggregate - 2.71
 - 6) Water absorption:
 - A. Coarse aggregate -1.0%
 - B. Fine aggregate - 2.0%
 - 7) Free surface moisture:
 - A. Coarse aggregate- Nil
 - B. Fine aggregate- 2.0%
 - 8) Sand confirms to zone III grading.
- Assume any other data required suitably

OR

- Q.5** (a) Enlist different nondestructive tests (NDT) use for evaluation of concrete. **03**
- (b) Write a note on 'High performance Concrete'. **04**
- (c) Explain Schmidt's Rebound Hammer test and the limitations and applications of the same. **07**
