

BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

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Course Code

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Fourth Semester B.E. Degree Examinations, July 2026

CONCRETE TECHNOLOGY

Duration: 3 hrs

Max. Marks: 100

Note: 1. Answer any FIVE full questions choosing ONE full Question from each Module.

2. Use of Code book IS 10262:2019 is permitted

3. Missing data, if any, may be suitably assumed

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBT:CO:PO)</u>
<u>Module-1</u>			
1.	a. What is hydration of cement? Explain Bogue's compounds.	10	(2 :1: 1.2.1)
	b. Mention different types of cement. Explain (i) Portland Pozzolana cement (ii) Sulphate resisting cement	10	(2 :1: 1.2.1)
(OR)			
2.	a. Briefly explain the factors effecting hydration of cement.	10	(2 :1: 1.2.1)
	b. Explain impact value abrasion value test on Coarse aggregate.	10	(2 :1: 1.2.1)
<u>Module-2</u>			
3.	a. Discuss the various factors affecting the workability of concrete.	10	(2 :2: 1.2.1)
	b. Explain the following with reference to the properties of fresh concrete. (i) Segregation of concrete (ii) Bleeding of concrete	10	(2 :2: 1.2.1)
(OR)			
4.	a. List the stages involved in the manufacturing process of concrete. Explain in detail mixing and transportation of concrete.	10	(2 :2: 1.2.1)
	b. Explain any two methods to measure workability of concrete.	10	(2 :2: 1.2.1)
<u>Module-3</u>			
5.	a. What is concrete mix design? Explain the objectives of mix design.	10	(2 :3: 1.2.1)
	b. Explain the variables in proportioning concrete mix design.	10	(2 :3: 1.2.1)
(OR)			
6.	Design a concrete mix of grade M35 (i) Grade designation: M35 (ii) Type of cement: OPC (iii) Max Nominal size of aggregate 20mm down size (iv) Min cement content and max water-cement ratio to be adopted and/or severe (for reinforced concrete). Exposure conditions as per table 3 and table 5 of IS456. (v) Workability: 75mm (slump) (vi) Method of concrete placing: chute (non pumpable)	20	(3 :3: 3.1.4)

Note: (RBT - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI- Performance Indicator)

- (vii) Degree of site control: Good
- (viii) Type of aggregate: crushed angular aggregate
- (ix) Maximum cement content : 450 kg/m³ including fly ash
- (x) Chemical admixture type: super plasticizer - normal
- (xi) Fine aggregate zone II
 - Cement Type of cement: OPC conforming to IS1489 (part 1)
specific gravity: 3.15
 - Coarse aggregate: specific gravity: 2.72 water absorption: 0.5% III
Fine aggregate: specific gravity 2.68 water absorption 1%
 - Chemical admixture super plasticizer conforming IS9103 specific gravity: 1.145

Module-4

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| 7. | a. | Explain the various factors affecting strength of hardened concrete. | 10 | (2 :4: 1.2.1) |
| | b. | Define strength of concrete and explain the different tests conducted for hardened concrete. | 10 | (2 :4: 1.2.1) |

(OR)

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| 8. | a. | Calculate the Gel/space ratio and the theoretical strength of a sample of concrete made with 500 gm of cement and 0.6 w/c ratio, on full hydration and 70 % hydration. | 10 | (2 :4: 1.2.1) |
| | b. | Explain the maturity concept for strength development of concrete. | 10 | (2 :4: 2.1.4) |

Module-5

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| 9. | a. | What is durability of concrete? Explain the factors affecting durability of concrete. | 10 | (2 :5: 1.2.1) |
| | b. | Discuss the sulphate and chloride attack on concrete. | 10 | (2 :5: 1.2.1) |

(OR)

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| 10. | a. | Explain the relation between modulus of elasticity and strength of concrete. | 10 | (2 :5: 1.2.1) |
| | b. | Define creep and briefly explain the factors effecting creep of concrete. | 10 | (2 :5: 1.2.1) |

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