**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI**
**(MID SEMESTER EXAMINATION)**

**CLASS: B.Tech** **SEMESTER : V/ADD**
**BRANCH: Civil** **SESSION : MO/2025**

**SUBJECT: CE413 CONCRETE TECHNOLOGY**

**TIME: 02 Hours** **FULL MARKS: 25**

**INSTRUCTIONS:**
**1. The question paper contains 5 questions each of 5 marks and total 25 marks.**
**2. Attempt all questions.**
**3. The missing data, if any, may be assumed suitably.**
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

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| Q.1(a) | You are designing a concrete mix for a cold-weather region where freezing and thawing cycles are common. Which admixture would you recommend adding to the mix, and what is its purpose? | [2] | CO3 | Apply |
| Q.1(b) | During a concrete pour, you find that the water being used is from a local river with high salinity. What problems could this cause in the concrete, and what would you do to mitigate these problems | [3] | CO1 | Analyze |
| Q.2(a) | A construction project requires concrete with high early strength gain. Which type of cement should be used, and why? | [2] | CO1 | Apply |
| Q.2(b) | During the preparation of concrete for a dam, it is necessary to reduce the heat of hydration to prevent cracking. Which mineral admixture should be considered, and why? | [3] | CO1 | Apply<br>Analyze |
| Q.3 | Explain the process of hydration of cement. Discuss the role of the major compounds of OPC in the development of strength and heat of hydration at different stages. | [5] | CO1 | Apply |
| Q.4(a) | If you observe bleeding in freshly placed concrete, what steps can you take to minimize it? | [2] | CO2 | Analyze |
| Q.4(b) | You are on a construction site with limited water supply. What measures can you take to maintain the workability of concrete without increasing the water-cement ratio? | [3] | CO3 | |
| Q.5(a) | What are segregation and bleeding in concrete? | [2] | CO1 | Understand |
| Q.5(b) | Explain any three methods of curing concrete. | [3] | CO1 | Understand |

**:::::22/09/2025 :::::M**