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**PRESIDENCY UNIVERSITY
BENGALURU**

**SCHOOL OF ENGINEERING
END TERM EXAMINATION - JUN 2023**

Semester : Semester II - 2022

Course Code : CIV1006

Course Name : Sem II - CIV1006 - Building Materials and Concrete Technology

Program : CIV

Date : 23-JUN-2023

Time : 1.00PM - 4.00PM

Max Marks : 100

Weightage : 50%

Instructions:

- (i) Read all questions carefully and answer accordingly.
 - (ii) Question paper consists of 3 parts.
 - (iii) Scientific and non-programmable calculator are permitted.
 - (iv) Do not write any information on the question paper other than Roll Number.
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PART A

ANSWER ALL THE QUESTIONS

(4 X 5 = 20M)

1. What are the various factors affecting the creep of concrete?
(CO3) [Knowledge]
2. Identify the effects of water absorption and moisture content of aggregates on concrete.
(CO1) [Knowledge]
3. Discuss the classification of bricks based on manufacturing and preparation.
(CO1) [Knowledge]
4. Why is slump test conducted? What are the various types of slump?
(CO2) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS

(5 X 10 = 50M)

5. Quality and quantity of building stones mainly depend upon the locally available material and requirement of structure. The stones which are cost-effective and locally available are in the topmost preference for construction. In addition to that there are some basic characteristics required to consider stone as a building material. Explain any five such basic characteristics of good building stone.
(CO1) [Comprehension]

6. Admixtures are added to alter the properties of fresh concrete per site and durability requirements. Explain the functions of superplasticisers and accelerators in concrete. (CO2) [Comprehension]
7. What are the different types of cement available in the market? Explain any three in detail. (CO2) [Comprehension]
8. Hollow Concrete Blocks have one or more large 'Holes' or 'Cavities', which either passes through the Block (open cavity) or just might been made to reduce the mass but not at the cost of its strength. In view of this statement, list out the various dimensions and tolerances in the concrete blocks set by Indian Standard Code. (CO1) [Comprehension]
9. Briefly explain the tests conducted on hardened concrete. (CO3) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS

(2 X 15 = 30M)

10. Design a concrete mix for M30 grade of concrete using fly ash as partial replacement of OPC as per IS10262: 2019 using the following data:

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|--|---------------------------------------|
| Type of cement: | OPC 43 Grade conforming IS 12269 |
| Type of fly ash: | Fly ash conforming to IS 3812 (Part1) |
| Maximum nominal size of aggregate | 20mm |
| Minimum cement content | 320 kg/m ³ (as per IS456) |
| Maximum free water-cement ratio | 0.45 |
| Workability | 75 mm slump |
| Exposure condition | severe (For Reinforced Concrete) |
| Method of concrete placing | Pumping |
| Degree of supervision | Good |
| Chemical admixture type: | Super Plasticizer -normal |
| The specific gravity of cement | 3.15 |
| The specific gravity of coarse aggregate 20mm | 2.78 |
| The specific gravity of fine aggregate | 2.70 |
| The specific gravity of Chemical admixture | 1.145 |
| Water absorption of coarse aggregate | 1 % |
| Water absorption of fine aggregate | 1.5 % |
| Grading of coarse aggregates is conforming to Table 2 of IS383 and grading of Fine aggregates falling in Zone II | Zone II |

Assume missing data suitably.

(CO3) [Application]

11. Design a concrete mix for M30 grade concrete as per IS10262: 2019 using the following data. Assume missing data suitably.

| | |
|--|--------------------------------------|
| Type of cement: | PPC conforming to IS 1489 (Part 1) |
| Maximum nominal size of aggregate | 20mm |
| Minimum cement content | 320 kg/m ³ (as per IS456) |
| Maximum free water-cement ratio | 0.45 |
| Workability | 100 mm slump |
| Exposure condition | severe (For Reinforced Concrete) |
| Method of concrete placing | Pumping |
| Degree of supervision | Good |
| Chemical admixture type: | Super Plasticizer -normal |
| The specific gravity of cement | 2.88 |
| The specific gravity of coarse aggregate 20mm | 2.75 |
| The specific gravity of fine aggregate | 2.66 |
| The specific gravity of Chemical admixture | 1.145 |
| The specific gravity of Chemical admixture | 1 % |
| Water absorption of coarse aggregate | 2 % |
| Water absorption of fine aggregate | Zone II |
| Grading of coarse aggregates is conforming to Table 2 of IS383 and grading of Fine aggregates falling in Zone II | |

(CO3) [Application]