Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
END TERM EXAMINATION - JAN 2023

Semester : Semester III - 2021
Course Code : CIV1006
Course Name : Sem III - CIV1006 - Building Materials and Concrete Technology
Program : B.Tech. Civil Engineering

Date : 9-JAN-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.

PART A

ANSWER ALL THE TEN QUESTIONS **10 X 2 = 20M**

1. The property to be considered for stones which are subjected to impact load is termed as (CO1) [Knowledge]
a) Toughness
b) Hardness
c) Specific gravity
d) Water absorption

2. The percentage of a alumina in a good brick clay should vary from (CO1) [Knowledge]
a) 20 to 30%
b) 30 to 40%
c) 40 to 50%
d) 50 to 60%

3. Aggregate abrasion value is determined by_____ (CO1) [Knowledge]
a) Aggregates crushing strength
b) Los Angeles abrasion test
c) Aggregates Impact value test
d) Ten percent fine test

4. Which chemical compostion has highest content in OPC?

a) Alumina (CO2) [Knowledge]

b) Silica

c) Lime

d) Iron oxide

5. Lime is added to cement for the purpose of

a) Color (CO2) [Knowledge]

b) binding nature

c) Controlling setting time

d) None of these

6. In order to obtain the best workability of concrete, the preferred shape of aggregate is_____

a) Rounded (CO2) [Knowledge]

b) Elongated

c) Angular

d) All of the above

7. Workability of concrete can be determined using _____

a) Slump cone test (CO2) [Knowledge]

b) Compaction factor test

c) VeBee Consistometer test

d) All of the above

8. The grade of concrete M 30 means that compressive strength of a 15mm cube after 28 days, is

a) 15 MPa (CO2) [Knowledge]

b) 20 MPa

c) 30 MPa

d) 40 MPa

9. In concrete mix ratio of 1:2:4 , the numbers refers to _____

a) 1 refers to cement, 2 refers to fine aggregate and 3 refers to coarse aggregates (CO3) [Knowledge]

b) 1 refers to cement, 2 refers to coarse aggregate and 3 refers to fine aggregates

c) 2 refers to cement, 1 refers to fine aggregate and 3 refers to coarse aggregates

d) 4 refers to cement, 2 refers to fine aggregate and 1 refers to coarse aggregates

10. What is the standard deviation value for M30 grade concrete as per Table2 given in IS10262: 2019

a) 2 (CO3) [Knowledge]

b) 5

c) 3.5

d) 6

PART B

ANSWER ALL THE FIVE QUESTIONS **5 X 10 = 50M**

11. A good quality concrete is a homogeneous mixture of cement, coarse and fine aggregates and water in definite proportion. Each of the four constituents has a specific function. Explain the functional role of ingredients of concrete.

(CO2) [Comprehension]

12. The test on fresh concrete which results in measure of the behavior of a compacted inverted cone of concrete under the action of gravity and It measures the consistency or the wetness of concrete. Identify the name of the test and write the procedure in detail.

(CO2) [Comprehension]

13. Concrete is an excellent material in compression but it has very poor resistance to tensile stresses**.** Strength is dependent primarily the water to cement ratio. But it is also affected by other factors as well. Discuss briefly the factors inflencing the strength of concrete.

(CO2) [Comprehension]

14. The rate of heat generationis increses with temperature during cement hydration and hydration reaction can become extremely slow at low temperature. Explain in detail the various stages in heat of hydration of cement.

(CO1) [Comprehension]

15. Different blends of cement used in construction are characterized by their physical properties. Some key parameters control the quality of cement. Explain in detail the various physical properties of cement.

(CO1) [Comprehension]

PART C

ANSWER ALL THE TWO QUESTIONS **2 X 15 = 30M**

16. Design a concrete mix for M35 grade of concrete using fly ash as partial replacement of OPC as per IS10262: 2019 using the following data:

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/m3 (as per IS456)
Maximum free water-cement ratio	0.45
Workability	100 mm slump
Exposure condition	severe (For Reinforced Concrete)
Degree of supervision	Good
Chemical admixture type:(1% by weight of cement)	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
Grading of coarse aggregates is conforming to Table 2 of IS383 and grading of Fine aggregates falling in Zone II	Zone II

(CO3) [Application]

17. Design a concrete mix for M40 grade concrete as per IS10262: 2019 using the following data

Type of cement:	PPC conforming to IS 1489 (Part 1)
Maximum nominal size of aggregate	20mm
Minimum cement content	320 kg/m3 (as per IS456)
Maximum free water-cement ratio	0.45
Workability	125 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
Grading of coarse aggregates is conforming to Table 2 of IS383 and grading of Fine aggregates falling in Zone II	Zone II

(CO3) [Application]

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