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**END SEMESTER (REGULAR/RETEST)  
EXAMINATION, JUNE – 2024**

Semester : 4th (New)

Branch : Civil Engineering

Subject Code : Cv – 406

**CONCRETE TECHNOLOGY**

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks  
for the questions.

**Instructions :**

- (i) Question Nos. 1, 2 and 9 are compulsory.
- (ii) Answer any *five* questions from the rest.
- (iii) Use of IS 10262-2009 is permitted.

1. Fill in the blanks : 1×10=10

- (a) To perform the initial setting time test, the water is added to the cement at the rate \_\_\_\_\_ by weight of cement.
- (b) The process of consolidating concrete mix after placing it in position is termed as \_\_\_\_\_.

[Turn over

- (c) Workability of concrete by slump test is expressed in \_\_\_\_\_.
- (d) The initial setting time of OPC should not be less than \_\_\_\_\_.
- (e) The ratio of various ingredients in concrete of grade M20 is \_\_\_\_\_.
- (f) To prevent segregation, the maximum height of placing concrete is \_\_\_\_\_.
- (g) As water-cement ratio increases, \_\_\_\_\_ also increases.
- (h) The process of mixing, transporting, placing and compacting concrete using Ordinary Portland Cement should not take more than \_\_\_\_\_ minutes.
- (i) Characteristic Compressive strength of concrete is measured at \_\_\_\_\_ days.
- (j) In case of hand mixing of concrete, the extra cement to be added is \_\_\_\_\_.

2. Choose the correct answers :

1 × 5 = 5

- (a) Strength of concrete increases with
  - (i) increase in water-cement ratio
  - (ii) increase in fineness of cement
  - (iii) decrease in curing time
  - (iv) decrease in size of aggregate



(b) If the slump of concrete mix is 75mm, its workability is considered to be

- (i) very high                      (ii) high
- (iii) medium                      (iv) low

(c) The choice of mix properties of a concrete is independent of

- (i) Grade designation
- (ii) Maximum nominal size of aggregate
- (iii) Minimum water cement ratio
- (iv) Batching, mixing, placing and compaction technique

(d) The most commonly used admixture which prolongs the setting and hardening time is

- (i) Gypsum                      (ii) Calcium chloride
- (iii) Sodium silicate              (iv) All of these

(e) The compaction of concrete improves

- (i) Density                      (ii) Strength
- (iii) Durability                      (iv) All of these.

3. (a) Define Normal consistency, Initial and Final setting time of cement. 3

(b) What are the important elements of cement clinker ? Write down the important effects of any two on properties of cement. 2+4=6

4. (a) What is the main objective of concrete mix design ? Write down the nominal mix ratios for M15 and M20 concrete.  $3+2=5$
- (b) What is non-destructive testing of concrete ? Name two methods of non-destructive testing of concrete. 4
5. (a) What are the different types of chemical admixture used in concrete construction ? Write down the functions of each of them.  $3+4=7$
- (b) Define M25 Concrete. 2
6. (a) What are the precautions that are to be taken during transportation and placing of concrete in formwork ?  $3+3=6$
- (b) Explain, how the compaction effect on the strength of concrete ? 3
7. (a) For M30 grade of concrete with w/c ratio as 0.4, calculate the mix proportions with angular surface dried coarse aggregate of maximum size 10mm, 50mm slump with moderate exposure condition. Assume any missing data required as per code. 6
- (b) Explain the factors affecting creep of concrete. 3



8. (a) Why curing is necessary for concrete ? Mention the different methods of curing with their application as example.  $2+4=6$
- (b) What are the precautions to be taken while handling hot weather concrete ? 3
9. Write short notes on the following :  $2\frac{1}{2}\times 4=10$
- (a) Fibre reinforced concrete
  - (b) High performance concrete
  - (c) Shrinkage of concrete
  - (d) Workability of concrete .