

June 2022

CONCRETE TECHNOLOGY

Time Allowed: 3 Hours

Full Marks: 60

Answer the following questions from Group-A, B & C as directed.

Group A

1. Choose the correct answer from the alternatives (any ten): 1 x 10
- i. The mixture of different ingredients of cement, is burnt at _____.
a) 1000°C b) 1200°C c) 1400°C d) 1900°C
 - ii. On the basis of shape, the aggregate having the highest workability is _____.
a) rounded b) angular c) elongated d) flaky
 - iii. For a good cement, Lime saturation factor should be _____.
a) 0.5 to 0.85 b) 0.55 to 0.9 c) 0.66 to 1.02 d) 0.8 to 1.02
 - iv. For Soundness test of cement the apparatus used _____. a) Vicat apparatus b) Le-Chatelier apparatus c) Air permeability apparatus d) None of these
 - v. Fineness Modulus of sand indicates aggregates _____. a) density b) size c) Sp. gravity d) shape
 - vi. Air entrainment in concrete increases _____. a) Strength , b) Workability , c) The effect of temp variations , d) The unit weight
 - vii. Pick up the incorrect statement from the following—(a) In properly graded aggregates bulk density is more. (b) In the single-sized aggregate, bulk density is least. (c) In the single-sized aggregate, bulk density is maximum. (d) In properly graded aggregates bulk density is minimum.
 - viii. Plastic shrinkage may be caused due to _____. (a) rapid evaporation of moisture (b) exposure to high wind (c) hot sun (d) all of these
 - ix. To ensure the quality of concrete we should use - (a) single-sized aggregates (b) two sized aggregates (c) graded aggregates (d) coarse aggregate
 - x. The compressive strength of OPC after three days is expected to be more than _____.
(a) 16 Mpa (b) 22 MPa (c) 27.5 Mpa (d) 33 Mpa
 - xi. The characteristic compressive strength of M25 concrete is- a) 25 KN/sq. m.; b) 25 N/sq. m.; c) 25 N/sq. mm; d) 25 N/sq. cm. <https://www.wbscteonline.com>
 - xii. Bulking of sand is maximum for _____. (a) Coarse sand (b) Fine Sand (c) Medium Sand (d) all three have equal bulking.
 - xiii. Curing of pavements, floors, roofs and slabs, is done by- a) Membrane method b) Ponding method c) covering surface with gunny bags d) Sprinkling water method.
 - xiv. In vicat's apparatus the cement paste is said to be of normal consistency if the rod penetrates by _____.
(a) 23 to 25 mm (b) 5 to 10 mm (c) 43 to 45 mm (d) 30 to 35 mm
 - xv. The minimum amount of water required for complete hydration of cement by weight of cement is-
(a) 23% (b) 15% (c) 38% (d) 50%

2. Fill in the blanks (any ten):

- Aluminium powder is _____ admixture.
- Slump of 25 mm indicates _____.
- According to IS: 2386 part-IV, each layer is tamped _____ times in crushing test.
- Concrete is not recommended to be placed at a temperature above _____.
- The minimum grade of concrete for severe exposure conditions is _____.
- For very low workability vee bee degree in second is _____.
- Kelly Ball test is used to determine _____ of concrete.
- Water cement ratio is _____.
- The aggregate containing moisture in pores and having its surface dry, is known as _____.
- When high early strength is required _____ cement are used.
- Low heat Cement is used for _____.
- The IS code used for concrete mix design purposes is _____.
- The chemical reaction between cement and water is called _____.
- The early heat of hydration is mainly contributed by _____.
- The colour of fresh OPC cement is _____.

3. Answer the following questions (any ten):

1x10

- 53 grade of cement, what it indicates?
- In M20 concrete, what do you understand by "M"?
- Why it is necessary to add Gypsum in the manufacturing of cement?
- How can the heat of hydration of cement be reduced?
- What is the approx. mix proportion for M10?
- Vicat's apparatus is used to perform the soundness test of cement. (state True/ False)
- How many methods of batching are there?
- What is shrinkage of concrete?
- Give an example of water-reducing admixture.
- What is curing?
- What is the full form of NDT?
- For pumping concrete we used rounded aggregate. (state True/ False)
- What is meant by bleeding of concrete?
- What is the unit of specific surface area of cement?
- What is the importance of the Standard Consistency Test?

Group B

4. Answer the following questions (any six):

2x6

- Write the composition of Portland cement.
- What is heat of hydration?
- What is the initial and final setting time of Ordinary Portland cement?
- Define flakiness index of aggregate.
- Define elongation index of aggregate.
- What is RMC?
- How can the heat of hydration of cement be reduced?
- Write short note on- controlled concrete.
- Name two commonly used accelerator.
- What is the Fineness Modulus of aggregate?
- Explain how size of aggregate affects the property of concrete.

Group C

5. Answer the following question (any one):

1x6

- Describe the process of the manufacturing of cement by wet process.
- Enlist the functions of different types of admixtures.
- Describe in brief the different types of cement.

6. Answer the following question (any one):

1x6

- a) What do you mean by compaction? Name the different methods of compactions.
- b) What are the precautions of placing concrete?
- c) Define Mix Design. What are the variable factors to be considered during Mix Design?

7. Answer the following question (any one):

1x6

- a) What is segregation of concrete? What are its causes?
 - b) Write down the specification of water as per IS code.
 - c) Explain the cold weather concreting. What are the precautions to be taken?
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