Concrete Technology (313322)

MSBTE Diploma · K-Scheme · Model Question Paper — Set A

Time: 3 Hours **Max. Marks: 70**

Instructions:

1. All questions are compulsory.
2. Answer each next main question on a new page.
3. Illustrate your answers with neat sketches wherever necessary.
4. Figures to the right indicate full marks.
5. Assume suitable data, if necessary.
6. Mobile phone, pager and any other electronic communication devices are not permissible in the examination hall.

Q.1 Attempt any FIVE of the following: **10**

a) Write the chemical formulae of the four Bogue's compounds of OPC.

b) Define fineness modulus of aggregate. State its range for medium sand.

c) State any two field applications of rapid hardening cement.

d) Define workability of concrete.

e) State the minimum stripping time of formwork as per IS 456 for: i) vertical faces of columns ii) soffit of slabs (props refixed).

f) Define bleeding of concrete.

g) Enlist any four mineral admixtures used in concrete.

Q.2 Attempt any THREE of the following: **12**

a) Describe the procedure to determine initial and final setting time of cement using Vicat apparatus with a neat sketch.

b) State any four field tests on cement to judge its quality at site.

c) Calculate the fineness modulus of fine aggregate from the following sieve analysis. Total mass of sample = 1000 g.

IS sieve	4.75 mm	2.36 mm	1.18 mm	600 µm	300 µm	150 µm	Pan
Mass retained (g)	40	110	210	260	220	120	40

d) State any four requirements of good aggregates for concrete.

Q.3 Attempt any THREE of the following: **12**

a) State Duff Abrams' water–cement ratio law. Explain with a neat graph the effect of w/c ratio on compressive strength of concrete.

b) Explain the slump cone test for workability of concrete with a neat sketch. Draw the types of slump.

c) Describe the procedure to determine aggregate impact value with a neat sketch. State the IS limits.

d) State the necessity of supervision in concreting operations.

Q.4 Attempt any THREE of the following: **12**

a) Explain the different types of vibrators used for compaction of concrete with sketches. State the use of each.

b) Define admixture. Classify the admixtures used in concrete.

c) Explain fly ash as a mineral admixture. State its effects on properties of concrete.

d) Define self-compacting concrete (SCC). State its constituents and any four advantages.

e) Differentiate between steel formwork and timber formwork. (Any four points)

Q.5 Attempt any TWO of the following: **12**

a) Explain the step-by-step procedure of concrete mix design as per IS 10262:2019.

b) Explain the laboratory procedure to determine the compressive strength of concrete cubes as per IS 516 with reference to: i) Preparation of test specimen ii) Procedure of testing iii) Interpretation of results.

c) Define segregation and bleeding of concrete. State their causes and the measures to prevent them.

Q.6 Attempt any TWO of the following: **12**

a) Explain the bulking of sand with a neat sketch. In a test, a container filled with moist sand showed a height of 200 mm; after inundating the same sand with water its height became 164 mm. Calculate the percentage bulking and state its effects on concrete.

b) Define curing. Explain any four methods of curing and state the minimum curing period as per IS 456.

c) List the different types of joints in concrete. Explain them with neat sketches.

Note: This is a **model question paper prepared by Ananda Technologies** only for practice and exam preparation, based on the pattern of previous MSBTE question papers and the K-scheme syllabus. It is **not an official MSBTE paper**, and it does **not** mean that these questions will come in the exam. Answers follow standard textbook points; marks shown are indicative. Free for students — anandatechnologies.in