Concrete Technology (313322)

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

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) Enlist the Bogue's compounds of cement. Which compound is responsible for early strength?

b) Define fine aggregate and coarse aggregate as per IS 383.

c) Define water–cement ratio.

d) List any four physical properties of ordinary Portland cement.

e) Classify the grades of concrete as per IS 456:2000.

f) State any two field applications of sulphate resisting cement.

g) Define fibre reinforced concrete. Name any two types of fibres used.

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

a) Explain the soundness test of cement by Le Chatelier apparatus with a neat sketch.

b) How will you check the quality of cement at site? Explain any four field tests.

c) Define flakiness index and elongation index. Explain how they are determined with sketches of the gauges.

d) 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)	20	50	100	180	340	250	60

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

a) Define workability. Explain the compaction factor test with a neat sketch.

b) State the water–cement ratio law and explain the significance of water–cement ratio in concrete.

c) Explain any four properties of hardened concrete.

d) State any four precautions to be taken while placing concrete.

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

a) Define admixture. Differentiate between retarding and accelerating admixtures. (Any three points)

b) Explain silica fume as a mineral admixture. State its advantages.

c) Define formwork. State the stripping time of formwork for beams and slabs as per IS 456:2000.

d) Explain ready mixed concrete. State its advantages and disadvantages.

e) Define cold weather concreting. State its effects on concrete and the precautions to be taken.

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

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

b) Explain the procedure to determine the compressive strength of concrete cubes with reference to: i) Casting and curing of cubes ii) Testing iii) Calculation and interpretation of results.

c) State the importance of non-destructive testing of concrete. List the NDT methods and explain the rebound hammer test with its principle.

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

a) i) Suggest a suitable method of transportation of concrete for: 1) concrete supplied from an RMC plant 15 km away 2) lining of a tunnel 3) mass concrete of a dam.
ii) Suggest the type of vibrator for: 1) RCC column 2) thin, heavily reinforced RCC wall 3) precast kerb and paver blocks.

b) Explain the field test to determine silt content of sand with a neat sketch. In a test the silt layer was 7 ml over a sand layer of 92 ml. Find the silt content, comment on the result and state the effects of excess silt on concrete.

c) Draw a neat labelled sketch of formwork for an RCC column. State the materials used for formwork.

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