Building Materials Important Questions PDF

Building Materials and Construction papers usually cover five areas: stones and bricks, cement and lime, concrete, building construction (foundations, masonry, stairs) and finishes with timber and modern materials. Most questions are theory, so learn clear definitions, tests and comparisons, then practise a few quantity numericals for concrete, brickwork and stairs. Use these practice questions alongside your own university syllabus and official papers.

Key takeaways

- These are practice questions based on common syllabus topics. They are not verified past papers.
- BMC is mostly theory. Comparison tables and labelled sketches score well.
- Learn the standard tests for bricks, cement and aggregates with their purpose and procedure.
- Practise quantity numericals: materials for 1 m³ of concrete, bricks per m³ and stair design.
- Quote Indian Standards only where you are sure of the number, such as IS 269 setting times for OPC.

Before you start: how to use these questions

These questions follow topics found in a standard Indian B.Tech Civil BMC syllabus. They are practice questions, not copies of any exam paper. Compare them with your own university syllabus and official question papers. AKTU students can use the AKTU old question paper archive, and Uncodemy lists more previous year question paper sources.

Unit 1: Stones and bricks

Definitions (2 to 3 marks)

- Classify rocks on geological, physical and chemical basis.
- What is dressing of stone? Name three types.
- State the qualities of a good building stone.
- What is efflorescence in bricks? What causes it?
- Give the standard modular size of a brick as per IS 1077. *Answer:* 190 × 90 × 90 mm actual, or 200 × 100 × 100 mm nominal with mortar.

Long answers

- Describe the manufacture of bricks: preparation of clay, moulding, drying and burning. Compare clamp burning with kiln burning.
- Explain the tests on bricks: compressive strength, water absorption, efflorescence, dimension tolerance and soundness.
- Explain the deterioration of stones and methods of preservation.
- Write short notes on fly ash bricks and AAC blocks, with advantages over clay bricks.

Numerical

- Find the number of modular bricks in 1 m³ of brickwork. *Outline:* volume of one brick with mortar = 0.2 × 0.1 × 0.1 = 0.002 m³, so 1/0.002 = 500 bricks. Add a wastage allowance if the question asks.

Unit 2: Cement, lime and mortar

Definitions

- What is Portland cement? Name the four main Bogue compounds (C3S, C2S, C3A, C4AF) and the role of each.
- Define initial and final setting time. *Answer:* for OPC as per IS 269, initial setting time is not less than 30 minutes and final setting time not more than 600 minutes.
- What is hydration of cement? What is heat of hydration?
- Differentiate fat lime and hydraulic lime.

Long answers

- Explain the dry and wet processes of cement manufacture with a flow diagram.
- Describe the laboratory tests on cement: fineness, standard consistency (Vicat apparatus), setting time, soundness (Le Chatelier) and compressive strength.
- Write notes on special cements: rapid hardening, low heat, sulphate resisting, Portland pozzolana and Portland slag cement.
- What are the functions of mortar? How is mortar classified?

Numerical

- Find the cement and sand needed for 1 m³ of cement mortar 1:6. *Outline:* take a dry volume factor of about 1.27 (textbooks use values from 1.25 to 1.33, so state the one you use). Sum of ratio = 7. Cement = 1.27/7 = 0.181 m³ = 0.181 × 1440 ≈ 261 kg, about 5.2 bags. Sand = 0.181 × 6 ≈ 1.09 m³. Mention that wastage and bulking of sand are extra.

Unit 3: Concrete and aggregates

Definitions

- Define workability. Name the slump, compaction factor and Vee-Bee tests.
- State Abrams' water-cement ratio law.
- What is curing? Why is it needed?
- Define bulking of sand and fineness modulus.
- What are admixtures? Give two examples each of accelerators, retarders and plasticisers.

Long answers

- Explain the factors affecting the strength of concrete.
- Describe the batching, mixing, transporting, placing and compaction of concrete.
- Explain the steps of concrete mix design as per IS 10262:2019 in outline.
- Compare nominal mix and design mix concrete.

Numericals

1. Find the quantities of cement, sand and coarse aggregate for 1 m^3 of M20 nominal mix (1:1.5:3). *Outline:* dry volume = 1.54 m^3; sum of ratio = 5.5. Cement = 1.54/5.5 = 0.28 m^3 = 0.28 × 1440 = 403.2 kg, about 8 bags of 50 kg. Sand = 0.28 × 1.5 = 0.42 m^3. Coarse aggregate = 0.28 × 3 = 0.84 m^3.
2. Find the fineness modulus from a sieve analysis table. *Outline:* FM = (sum of cumulative percentage retained on the standard sieves) / 100.

Unit 4: Building construction

Definitions

- Define foundation. Differentiate shallow and deep foundations.
- What is a raft foundation and when is it used?
- What is bond in brickwork? Define header, stretcher, queen closer and king closer.
- What is a damp proof course (DPC)?
- Define rise, tread, going, nosing and winder.

Long answers

- Explain spread footings, combined footings, raft and pile foundations with sketches.
- Compare English bond and Flemish bond with plan views for a one-brick wall.
- Explain the causes and effects of dampness and the methods of damp proofing.
- Describe the types of staircases: straight, dog-legged, open well and spiral.
- Explain types of doors and windows with sketches.

Numerical

- Design the steps of a dog-legged staircase for a floor height of 3.0 m with a rise of 150 mm. *Outline:* number of risers = 3000/150 = 20, 10 per flight. Using the rule 2R + T ≈ 600 mm, tread ≈ 300 mm. Treads per flight = risers - 1 = 9. Going per flight = 9 × 300 = 2.7 m. State that the exact rule follows your textbook.

Unit 5: Timber, finishes and modern materials

Definitions

- What is seasoning of timber? Compare natural and artificial seasoning.
- Name four defects in timber such as knots, shakes, rind galls and twisted fibres.
- What are the constituents of a paint? Define distemper and varnish.
- What is plastering? Name common plaster defects.

Long answers

- Explain the preservation of timber and common preservatives.
- Describe the types of flooring: cement concrete, terrazzo, tile and stone.
- Write notes on modern materials: glass, plastics, geosynthetics and ready mix concrete.
- Explain fire-resisting construction and the fire resistance of common materials.
- Write a note on green building materials and why they matter.

How to score well in Building Materials and Construction

- **Use tables for comparisons.** Shallow versus deep foundations, English versus Flemish bond, fat versus hydraulic lime: a four-row table answers faster than paragraphs.
- **Draw clean sketches.** Bonds, foundations, stairs and DPC answers need labelled diagrams.
- **Write test procedures in steps.** Apparatus, procedure, result and the IS reference if you are sure of it.
- **Do the numericals.** Quantity and stair numericals are short and easy to score fully.
- **Practise with official papers.** Solve at least three past papers from your own university under timed conditions.

A unit converter helps if a question mixes cubic feet and cubic metres, and the scientific calculator is handy for quantity checks.

Frequently asked questions

Are these BMC questions taken from past papers?

No. They are practice questions based on topics common to most B.Tech Civil BMC syllabi. Check your own university syllabus and official papers before the exam.

Which topics are most important in Building Materials and Construction?

Bricks and their tests, cement manufacture and tests, concrete workability and mix proportions, foundations, brick bonds and damp proofing appear in most syllabi.

Are there numericals in BMC?

Yes, but fewer than in design subjects. Expect quantity of materials for concrete, number of bricks, fineness modulus and stair design.

Do I need to remember IS code numbers?

Knowing key ones such as IS 269 for OPC, IS 456 for concrete and IS 10262 for mix design helps. Only quote a clause or value if you are sure of it.

Where can I find official AKTU BMC papers?

AKTU publishes old question papers at aktu.ac.in/old-question-paper.html. Other universities have their own archives.

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Sources and further reading

- AKTU old question papers
- Bureau of Indian Standards
- NPTEL: civil engineering courses

About this PDF

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