

BUILDING MATERIALS AND CONSTRUCTION

Paper Code: ETCE-207

Paper: Building Materials and Construction

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INSTRUCTIONS TO PAPER SETTERS:

Maximum Marks: 75

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

Objective: In this course, students will learn about different types of materials that are used in the construction industry to create buildings and structures.

UNIT I

Building Materials: Properties and uses of common types of stones, bricks, tiles and hollow building blocks, Pozzolonic Material, Cement, lime and mortar, Properties, types and applications of other building materials like timber, protective coverings [Paints and varnishes], rubber, bitumen, tar and asphalt, glass, plastics and polymers, refractory materials etc.

Plastering, Pointing, Painting, distempering, white washing, damp proofing, ventilation and air conditioning, Concept of thermal insulation, sound insulation, fire protection.

[T1,T2][No. of Hrs. 10]

UNIT II

Concrete: Cement, Sand, aggregates and water, Batching of concrete by weight and volume, Batching plant and equipment, workability, mix proportions and grades of concrete, types of mixers, transportation, pumping, placing and compacting of concrete. Admixtures, Formwork for RCC structures, Ready mix concrete, Pre-cast concrete.

Types of concrete: Special concrete, light weight concrete, high density concrete, vacuum concrete, shotcrete – steel fiber reinforced concrete, polymer concrete, Ferro cement, high performance concrete, self compacting concrete.

[T1,T2][No. of Hrs. 12]

UNIT III

Building construction: Components of building, shallow and deep foundations, Stone and brick masonry, type of bonds, load bearing walls, cavity wall, partition walls, finishing/coating materials for Roofs/floors/walls, construction and expansion joints, Introduction to Green building and LEED Classifications.

[T1,T2][No. of Hrs. 12]

UNIT IV

Stairs, lintels, trusses, arches, domes, doors and windows: Introduction, classification, types, material of construction.

Special Materials and Systems: Smart materials and structures, geosynthetics, nano-materials and bio-materials, Fire resistant materials, Sound Insulation.

[T1,T2][No. of Hrs. 10]

Text Books:

[T1] M.L.Gambhir and Neha Jamwal, “Building Materials”, Tata McGraw Hill.

[T2] Shushil kumar, “Building Construction”, Standard Publication

References Books:

[R1] Building Materials, P.C.Varghese, PHI Publications

[R2] Building construction, P.C.Varghese, PHI Publications

[R3] Engineering materials S.C. Rangwala, Charotar Publishing House

[R4] Building Materials, Duggal, New Age Publication

[R5] Building and Construction Materials, M.L. Gambhir and Neha Jamwal, Mc-Graw Hill