

## 2/4 B.Tech. THIRD SEMESTER

CE3T2

**BUILDING MATERIALS AND CONSTRUCTION**

**Credits: 4**

**Lecture: 4 periods/week**

**Internal assessment: 30 marks**

**Tutorial: 1 period /week**

**Semester end examination: 70 marks**

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### **Objectives:**

- To develop knowledge of building materials
- To learn the availability, types, uses and various tests for building materials
- To know about materials that are used for protection and functional purpose

### **Learning outcomes:**

Upon completion of the course students will have knowledge:

- On the usage of different building materials in the present-day construction.
- About the different construction activities in the building construction

## **BUILDING MATERIALS**

### **UNIT – I**

#### **STONES:**

Qualities of a good building stone; Stone quarrying; Tools for blasting; Materials for blasting; Process of blasting; Precautions in blasting; Dressing of stones; Common building stones of India.

### **UNIT – II**

#### **BRICKS:**

General; Composition of good brick earth; Harmful ingredients in brick earth; Classification of brick earth; Manufacture of bricks; Comparison between clamp burning and kiln burning; Qualities of good bricks; Tests for bricks; Classification of bricks; Colours of bricks; Size and weight of bricks; Shape of bricks; Fire – clays; Fire – bricks; Sand – lime or calcium silicate bricks.

### **UNIT – III**

#### **TIMBER:**

Definition; Classification of trees; Structure of a tree; Felling of trees; Defects in timber; Qualities of good timber; Decay of timber; Preservation of timber; Fire resistance of timber; Seasoning of timber; Market forms of timber; Industrial timber; Advantages of timber construction; Use of timber; Indian timber trees.

#### **STEEL:**

General; Manufacture of steel; Uses of steel; Factors affecting physical properties; Defects in steel; Market forms of steel; Properties of mild steel; Properties of hard steel; Corrosion of ferrous metals.

### **UNIT – IV**

#### **PAINTS, VARNISHES AND DISTEMPERS:**

General; Painting; Varnishing; Distempers; Wall paper; White washing; Colour washing.

## **ACOUSTICS OF BUILDINGS:**

Important Technical terms; Requirements of sound effects; Factors to be considered in Acoustics of building; Sound absorbing materials; Sound insulation.

## **BUILDING CONSTRUCTION**

### **UNIT – V**

#### **FOUNDATIONS:**

Concept of foundations; Factors affecting selection of foundations; Types of foundations; Strip, Isolated, Strap, Combined Footings, RAFT – MAT – Slab and BEAM RAFT, BOX TYPE RAFT, inverted arch foundations, SHELL foundations, Grillage foundations, Piles and their classification; Foundation on black cotton soils.

#### **STONE MASONRY:**

Technical terms; Classification of stone masonry.

### **UNIT – VI**

#### **BRICK MASONRY:**

Technical terms; Types of bonds in brickwork and their suitability, Plan, elevation and section of brick bonds up to two bricks thickness.

#### **WALLS:**

Classification of walls, Block masonry – Hollow concrete blocks – FAL- G Blocks, Hollow clay Blocks.

### **UNIT – VII**

#### **DAMPNESS AND DAMP PROOFING:**

Causes of dampness; Methods of preventing dampness; Damp proofing materials and their classification; Methods of providing DPC under different situations.

#### **FLOORS:**

Technical terms; Types of ground floors; Granolithic, Flag stone floorings with locally available stones such as Cuddapah, Betamcherla, Shabad etc., Marble Flooring, Terrazzo (Mosaic) Flooring, Rubber Flooring. Repair of floors.

### **UNIT – VIII**

#### **ROOFS:**

Technical terms; Classification of roofs; Steel sloping roofs; Roof covering materials; Types of flat roofs; drainage on flat roofs.

#### **SCAFFOLDING, SHORING, UNDER PINNING AND FORM WORK:**

Types of scaffolding; Types of shoring; Methods of underpinning; Types of formwork; Centering.

## **Learning resources**

### **Text books:**

1. Engineering Materials, (36<sup>th</sup> edition) by Rangwala, S.C., Anand Charotar Publishing House, 2009.
2. Building construction, (10<sup>th</sup> edition) by Punmia, B. C., Laxmi Publications, Bangalore, 2009.

**Reference books:**

1. Building construction and construction materials by Birdie, G.S. and Ahuja, T.D., Dhanpath Rai Publishing company, New Delhi, 1986.