AMAR-12 BUILDING MATERIALS - III

OBJECTIVES:

To have an understanding of the properties, characteristics, strength, manufacture, processing and application of materials such as cement, glass, paints and other finishing materials.

To inform about the properties, characteristics and use of concrete in construction including its manufacture

To inform about the properties, characteristics and manufacture of various type of concrete using aggregates.

UNIT I REQUIREMENTS OF INGREDIENTS FOR MORTAR/ CONCRETE 6

Cement: definition, composition, strength, properties, manufacture, test for cement, types of cement

Sand : sources, impurities, classification, tests for bulking of sand, quality of sand Coarse aggregate : Sources, shape, size, grading, sampling and analysis, impurities Water: sources, requirements, water quality, tests

UNIT II CEMENT CONCRETE AND ITS MANUFACTURE 6

Definition, properties, specification, proportioning, water-cement ratio, workability, curing, water-proofing, guniting, special concretes.

Manufacture, construction of formwork, placing, quality assurance testing, fabrication, incorporation of steel in concrete.

UNIT III TYPES OF CONCRETE AGGREGATES AND CONCRETE 9

Lightweight aggregates, aerated concrete, no-fines concrete, polymer concrete, RCC, pre-stressed concrete, fibre-reinforced concrete, ready-mixed concrete

UNIT IV SURFACE FINISHING, FLOORING AND DAMP-PROOFING 12

Surface finishing: Smooth finishes, textured finishes, ribbed, etched, exposed aggregate finish-weathering of finishes- external renderings- roughcast, dry dash, textured, stucco, gypsum and POP applications, protective and decorative coatings.

Paints- properties and defects in paints, enamels, distemper, plastic emulsion, special paints-fire retardant, luminous and bituminous paints.

Materials for damp-proofing and water-proofing concrete structures: Hot and cold applications, emulsified asphalt, vinyl, epoxy resins, chemical admixtures, bentonite clay etc.- properties, uses and cost of materials.

Types of flooring- laying methods for marble, mosaic, and terrazzo, plain cement flooring, flooring stones & tiles.

UNIT V GLASS 12

Composition of glass, brief study on manufacture, treatment, properties and uses of glass. Types of glass - float glass, cast glass, glass blocks, foamed glass. Decorative glass, solar control, toughened glass, wired glass, laminated glass, fire-resistant glass, glass blocks, structural glass - properties and application in building industry, glazing and energy conservation measures.

TOTAL: 45 PERIODS

OUTCOMES:

This subject helps the students to understand the properties characteristics. Strength, manufacturing process of various construction materials. Which in turn help them to choose the suitable materials according to the contact – In response to the surroundings.

REQUIRED READING:

M.S.Shetty, “Concrete Technology”, S.Chand, 2005.
S.C.Rangwala, “Engineering Materials”, Charotar Publishing House, India, 1997.
S.K Duggal, “Building Materials”, Oxford and IBM Publishing Co, Pvt Ltd, 1997.

REFERENCES:

1. Arthur Lyons, “ Materials for Architects and Builders”, An introduction Arnold, London, 1997.

Don A.Watson, “Construction Materials and Processes”, McGraw Hill Co., 1986.
S.N Sinha, “Reinforced Concrete Design”, Tata-McGraw Hill, New Delhi, 2002
Howard Kent Preston, “Prestressed concrete for Architects and Engineers”, McGraw Hill, New York, 1964