GOVERNMENT POLYTEHNIC COLLEGE, PULWAMA
Islamic University of Science & Technology, Awantipora
Syllabi for Lateral Entry Entrance Examination (Civil Engineering)

PART A (BASIC SCIENCES)

MATHEMATICS: (15 Marks)

UNIT- 1 Quadratic Equations

Standard form of Quadratic equation ax2+bx+c=0,(a=0), solution of quadratic equation (only real roots) by factorization any by completing the square, i.e.by using quadratic formulas, relationship between discriminant and nature of roots. Problems related to day to day activities to be incorporated

UNIT-2 Introduction to Trigonometry

Trigonometric ratios of an acute angle of a right angled triangle. Proof of their existence (well defined)

Values with proofs of the trigonometric ratios of 30',45' and 60'. Relationship between the ratios.

Trigonometric identities, Proofs and applications of the identity $\text{Sin } 2A + \text{Cos}2A = 1$, only simple identities to be given.Trigonometric ratios of complementary angles.

Heights and Distances :

Simple and believable problems on heights and distances. Problems should not involve more than two right triangles. Angle of elevation/ depression should be only 30^o , 45^o ,60^o .

UNIT-3Mensuration/ Surface Areas and Volumes

Problems on finding area/surface areas / volumes of different geometrical figures &combinations of any two of the following:

Cubes, cuboids, spheres, hemispheres and right circular cylinders/ cones, frustum of a cone.

CHEMISTRY: (15 Marks)

UNIT-1 Chemical Reactions and Equation

- Chemical equation, writing of chemical equation; Balancing chemical equations.
- Types of chemical reactions; Viz. Combination reactions; Decomposition reactions;
- Displacement reactions; Double displacement reactions; Oxidation and reduction.
- Effects of oxidation and reduction reactions in everyday life, viz. corrosion and rancidity

UNIT-2 Carbon and its compounds

- Bonding in Carbon, Covalent bond, Allotropes of carbon;
- Versatile nature of carbon; Saturated and unsaturated hydrocarbons; chains; Branches and rings; homologous series and its characteristics; nomenclature of Carbon compounds.
- Chemical properties of carbon compounds viz. combustion; oxidation; Addition and substitution reactions.
- Important Carbon compounds and their properties.

UNIT-3 Metals and non-metals

- Physical properties of metals and non-metals.
- Chemical properties of metals like action of water, air, acids, salts; Reactivity series of metals.
- Cause of reactivity of metals and non-metals. Properties of ionic compounds.
- Occurrence of metals; their extraction, enrichment of ores, Extraction of metals in accordance with activity series; refining of metals.
- Corrosion of metals

PHYSICS: **(15Marks)**

Unit 1 Laws of Motion /Friction

Concept of Distance, Displacement, speed, velocity& acceleration
Newton's laws of motion and its applications
Friction, Types of Friction and its applications.

Unit 2 Work, Power & Energy

Concept of Work, Power & Energy and their units.
Simple numerical on Work, power & energy.

Unit 3 Force

Concept of Force and its units.Laws of Forces and determination of Resultant of forces.Simple numerical for calculating resultant and direction of forces.

PART B (CIVIL ENGINEERING)

Drawing: **(Marks10)**

- Conventions/ Conventional brakes
- Symbols of Electrical / Mechanical /Civil equipments/appliances
- Different types of lines

CONSTRUCTION MATERIALS(Marks 15)

Unit 1 Bricks

Introduction to bricks, Raw materials for brick manufacturing and properties of good brick
Moulding of bricks
Burning of bricks
Classification of bricks

Unit 2 Cement

Introduction
Different types of cement
Tests of cement – fineness, soundness, initial and final setting time etc.
Properties of cement

Unit 3 Timber

Seasoning of timber: Purpose, methods of seasoning
Properties of timber and specifications of structural timber
Defects in timber, decay in timber
Preservation of timber and methods of treatment

Unit 4 Lime

Classification and types of lime
Calcination and slaking of lime

BUILDING CONSTRUCTION (Marks 15)

Unit 1 Foundation

Concept of foundation and its purpose
Types of foundation-shallow and deep
Layout/setting out for surface excavation, cutting and filling
Excavation of foundation, trenches, shoring, timbering and de- watering

Unit 2 Masonry

Brick Masonry: Definition of terms like header, stretcher, queen closer, king closer, frog and quoin, course, bond, facing, backing, hearting, jambs, reveals, soffit, plinth, pillars and pilasters
Bond – meaning and necessity; English, flemish bond and other types of bonds

Construction of brick walls –methods of laying bricks in walls, precautions observed in the construction of walls, methods of bonding new brick work with old (toothing, raking, back and block bonding), Expansion and contraction joints
Types of stone masonry: rubble masonry - random and coursed; Ashlar masonry, principles to be observed in construction of stone masonry walls

Unit 3 Doors, Windows

Classification based on materials i.e. wood, metal and plastic and their suitability for different situations. Different type of doors- panel door, flush door, glazed door, rolling shutter, steel door, sliding door, plastic and aluminium doors
Window – Panel window, glazed windows (fixed and openable) ventilators, sky light window, plastic and aluminium windows.

Unit 4 Damp Proofing and Water Proofing

Sources of dampness - moisture penetrating the building from outside e.g. rainwater, surface water, ground moisture.
Damp proofing materials and their specifications

Concrete Technology(Marks 15)

Ingredients of Concrete
Classification of aggregates according to size and shape
Properties in plastic state: Workability, Segregation, Bleeding and Harshness
Storing of Cement:Storing of cement in a warehouse, Storing of cement at site
Curing: Objectives of curing, methods of curing like ponding, membrane curing, steam curing, chemical curing, Duration for curing and removal of form work