SYLLABUS FOR THE POST OF LAB ASSISTANT (GEOGRAPHY)

UNIT-I

Continental Drift, Plate Tectonics, Endogenetic & Exogenetic Forces; Denudation and Weathering, Geomorphic Cycle (Davis, Penck, King), Theories and Process of Slope Development, Earth Movements (Seismicity, Folding, Faulting and Vulcanicity) and Different Landforms

UNIT –II

Composition and Structure of Atmosphere; Insolation, Heat Budget of Earth, Temperature, Pressure and Winds, Atmospheric Circulation (air-masses, fronts and upper air circulation, cyclones and anticyclones (tropical and temperate), Climatic Classification of Koppen & Thornthwaite, Climate Change: Evidences and Causes.

UNIT-III

Relief of Oceans, Composition: Temperature, Density and Salinity, Circulation: Warm and Cold Currents, Waves, Tides, Tsunami, Global Water Budget, Drainage Basin & its Characteristics, Hydrographs: Types, Components & Factors Influencing its Shape, Base Flow, Flood Frequency Analysis & Flood Design

UNIT –IV

Components of Ecosystem, Trophic Levels, Energy Flows, Cycles (geo-chemical, carbon, nitrogen and oxygen), Food Chain, Food Web and Ecological Pyramid, Environmental Ethics and Deep Ecology, Environmental Hazards and Disasters (Urban Heat Island, Pollution, Land Degradation)

UNIT-V

Sources of Population Data; World Population Distribution & Growth; Demographic Transition, Theories of Population Growth (Malthus, Sadler, and Ricardo); Fertility and Mortality Analysis (Indices, Determinants and World Patterns); Population Characteristics of India (Rural-Urban, Age, Sex, Occupational and Religious); Population Projection Methods

UNIT–VI

Maps and their Types; Scales, Coordinate Systems, Time Zonation & Map Projections; Techniques of Map Making (Choropleth, Isarithmic, Dasymetric, Chorochromatic, Flow Maps); Data Representation on Maps (Pie diagrams, Bar diagrams and Line Graph); Map Design & Layout; Hythergraph and Climograph; Services of Survey of India (SOI), National Atlas & Thematic Mapping Organization (NATMO)

UNIT–VII

Sampling Techniques; Correlation and Regression Analysis; Multivariate analysis through Principal Component Analysis (PCA); Measures of Inequality: Lorenz Curve, Gini's Coefficient

and Location Quotient; Hypothesis and its Testing: T-Test, Chi-Square Test, ANOVA; Trend Analysis: Mann–Kendall Test; Morphometric Analysis: Ordering of Streams, Bifurcation Ratio, Drainage Density and Drainage Frequency, Basin Circularity Ratio and Form Factor, Profiles, Slope Analysis, Clinographic Curve, Hypsographic Curve and Altimetric Frequency Graph.

UNIT–VIII

Concepts of Surveying, Methods and Instruments; Survey Types; Errors and Accuracy; Survey Techniques (Autonomous, Differential, RTK); Total Station: Components, Functions, Setup (Leveling, Centering, Orientation) and Measurement of Angles, Distances and Heights; Land Parcel Area Computation; GPS Components (space, ground control and receiver segments) and Applications; Segments and Positioning Principles

UNIT–IX

Basics of Remote Sensing (Electromagnetic Spectrum, Sensors and Platforms, Resolution and Types, Elements of Air Photo and Satellite Image Interpretation and Photogrammetry), Types of Aerial Photographs, Digital Image Processing; Developments in Remote Sensing Technology; Big Data Sharing and its Applications in Natural Resources Management in India

UNIT–X

Components of GIS; GIS Database (raster and vector data formats and attribute data formats); Functions of GIS (Conversion, Editing and Analysis), Georeferencing (Coordinate System and Map Projections and Datum); Data Input Methods; Data editing and Error Correction; Topology: Connectivity, Adjacency and Containment; Digital Elevation Model (DEM); GIS Applications (Thematic Cartography, Spatial Decision Support System)