

## **1. Land Surveying:**

### **1.1 Fundamentals of Surveying**

- 1.1.1 Historical background
- 1.1.2 Modern Surveying
- 1.1.3 Application of Surveying
- 1.1.4 Standardization
- 1.1.5 Surveying and Digital Environment

### **1.2 Application in Construction Surveying;**

- 1.2.1 Buildings
- 1.2.2 Pipe lines
- 1.2.3 Highways
- 1.2.4 Tunnels
- 1.2.5 Bridges, dams, canals
- 1.2.6 Transmission lines
- 1.2.7 Setting out Surveys

## **2. Cartography and Map Production**

- 2.1 Nature and Scope of Cartography and earth as a Cartographic Problem
- 2.2 Scales, direction and co-ordinates
- 2.3 Map projections
- 2.4 Cartographic Techniques and methods of Map production
- 2.5 Conceptual Modeling, Digital Landscape Modeling, Digital Cartographic Modeling and cartographic generalization
- 2.6 Map compilation and small-scale mapping
- 2.7 Semiology
- 2.8 Colour in cartography
- 2.9 Map design and layout
- 2.10 Toponymy and Typography
- 2.11 Map Reproduction: Photography, Copying & Plate making and Printing
- 2.12 Topographic cartography: large scale and base maps
- 2.13 Mapping of relief
- 2.14 Thematic cartography
- 2.15 Automation in cartography
- 2.16 Desktop Publishing

## **3. Spatial Information Systems and Digital Terrain Model**

- 3.1 Computer Hardware, Software, Networks
- 3.2 Data hierarchy and Georeferencing
- 3.3 Geometric Transformations
- 3.4 Spatial Information System, International Terrestrial Reference Frame
- 3.5 Data Structure, Spatial/Non spatial data, Data source and applications
- 3.6 Spatial database; Management, design and Maintenance
- 3.7 Data Quality and Data Security
- 3.8 Spatial Information System and Decision Making

## लोक सेवा आयोग

नेपाल इन्जिनियरिङ सेवा, सर्भे समूह, राजपत्राङ्कित द्वितीय श्रेणी, उपसचिव वा सो सरह पदको खुला र आन्तरिक प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

- 3.9 GIS Components
- 3.10 Spatial Analysis Function
- 3.11 DTM: Method, HW & SW for collection, storage and display of digital mapping data.
- 3.12 Display and analysis of gridded and irregularly spaced data
- 3.13 ICT Applications
- 3.14 GIS applications and Uses of DTM
- 3.15 Geographic Information Infrastructure; Components, Standards, Clearinghouse, Metadata and Policies, GSDI, NGII

### **4. Geodesy:**

- 4.1 Spherical, Geodetic and Astronomic co-ordinates
- 4.2 Transformation of co-ordinates
- 4.3 Astronomical Positioning
- 4.4 Geodetic Datum and Reference ellipsoids
- 4.5 Space Geodesy and Global Positioning System Applications
- 4.6 Gravity force, Potential and anomaly
- 4.7 Gravimeters and their uses
- 4.9 Theory of measurement errors and Least Square Adjustment

### **5. Cadastre:**

- 5.1 Land Registration : Land Rights and Land records; Land Transfer; Registration of deeds; Registration of Titles; Fragmentation and consolidation; Horizontal Subdivision; Systematic Adjudication; Land tenure; Land Record in Nepal; Land Registries.
- 5.2 Cadastral Surveying: Principles of cadastral surveying; Boundaries; Parcel; Cadastral Survey Methods; Cadastral Systems; Cadastral Interface; Maintenance of Cadastre; Land Laws.
- 5.3 Land Management: Principles of Management; Cadastral Organization; Land Development; Planning; Financial Matters; Land use; Land Management; Land Information System; Land Administration.

### **6. Photogrammetry, Remote Sensing and Digital Image Processing:**

- 6.1 Principle of Photogrammetry
- 6.2 Aerial Camera
- 6.3 Aerial Photography
- 6.4 Photogrammetry; Analogue, Analytical and Digital
- 6.5 Orientation
- 6.6 Rectification
- 6.7 Orthophoto
- 6.8 Principle of Satellite Remote Sensing
- 6.9 Multispectral, Thermal and Hyperspectral Sensors
- 6.10 Earth Resource Satellites
- 6.11 Radiometric and Geometric Corrections
- 6.12 Digital image processing
- 6.13 Image classification; supervised, unsupervised
- 6.14 Ground truthing, Error matrix and Accuracy test
- 6.15 Application of Photogrammetry and Remote sensing

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