



प्राविधिक शिक्षा तथा व्यावसायिक तालीम परिषद्
नेपाल बनेपा पोलिटेक्निक इन्स्टिच्यूट
पदपूर्ति उप-समिति
बनेपा, काभ्रेको

जियोमेटिक्स/सर्भे प्रशिक्षक
(सर्भे इन्जिनियरिङ्ग उप-समूह) (अधिकृत स्तर तृतीय श्रेणी प्राविधिक) पदको
लिखित परीक्षाको पाठ्यक्रम

सेवा : प्राविधिक तथा प्रशिक्षण	प्रशिक्षण समूह : इन्जिनियरिङ्ग प्राविधिक प्रशिक्षण	उपसमूह : जियोमेटिक्स/सर्भे इन्जिनियरिङ्ग
पद : जियोमेटिक्स/सर्भे प्रशिक्षक	स्तर : अधिकृत स्तर तृतीय	
पाठ्यक्रमको रूपरेखा : यस पाठ्यक्रमको आधारमा निम्नानुसार दुई चरणमा परीक्षा लिइनेछ।		
प्रथम चरण : लिखित		परीक्षा पूर्णाङ्क : १००
द्वितीय चरण : अन्तरवार्ता		पूर्णाङ्क : २५

प्रथम चरण: लिखित परीक्षा योजना

पत्र	बिषय	खण्ड	परीक्षा प्रणाली	प्रश्न संख्या	अंक भार	समय	पूर्णांक	उत्तीर्णांक
द्वितीय	सेवा सम्बन्धी प्राविधिक विषय	सेवा सम्बन्धी समूह/उपसमूहको प्राविधिक विषय	बस्तुगत बहुउत्तर (Multiple Choice)	२५	२५X२=५०	३० मिनेट	१००	४०
			बिषयगत (Subjective)	५	५X१०=५०	१ घण्टा ३० मिनेट		

द्वितीय चरण :: अन्तरवार्ता योजना

बिषय	पूर्णांक	परीक्षा प्राणली
अन्तर्वार्ता	२५	मौखिक

जियोमेटिक्स/सर्भे प्रशिक्षक (सर्भे इन्जिनियरिङ्ग उप-समूह)
(अधिकृत स्तर तृतीय श्रेणी प्राविधिक) पदको
लिखित परीक्षाको पाठ्यक्रम

विषय: सेवा सम्बन्धी सम्बन्धित प्राविधिक विषय

पूर्णाङ्क - १००

1. Fundamentals of Surveying
 - 1.1 Objective, Principles and Disciplines of surveying
 - 1.2 Linear measurement techniques
 - 1.3 Principle and methods of chain surveying
 - 1.4 Types, sources of errors in measurements, precision and accuracy
 - 1.5 Principle and methods of plain table surveying
 - 1.6 Advantages and disadvantages of plain table surveying
 - 1.7 Bearings, types and bearing systems, magnetic declination
 - 1.8 Local attraction in compass survey
 - 1.9 Compass traversing, computation of bearing, errors and adjustments
 - 1.10 Application of surveying in hydropower development
 - 1.11 Plotting and Mapping
2. Survey Management
 - 2.1 Survey team
 - 2.2 Terms of reference
 - 2.3 Survey design, specification and costing
 - 2.4 Equipment
 - 2.5 Safety management
 - 2.6 Professional ethics, code of conduct
 - 2.7 Coordination with institutions
3. Levelling
 - 3.1 Principle of levelling
 - 3.2 Methods of computation of reduced level
 - 3.3 Two peg test
 - 3.4 Differential levelling, fly levelling, reciprocal levelling
 - 3.5 Profile levelling, cross sectioning
 - 3.6 Sources of errors in levelling
 - 3.7 Errors, precision and adjustment of errors
4. Traversing
 - 4.1 Measurement of horizontal and vertical angles
 - 4.2 Closed traverse and linked traverse
 - 4.3 Horizontal and vertical control of traverse
 - 4.4 Computation of angles, bearings, latitudes and departures, independent coordinates
 - 4.5 Errors, precision and adjustment in angles, bearings and coordinates
 - 4.6 Plotting of traverse and topographic map
5. Tacheometry
 - 5.1 Principle of tacheometry
 - 5.2 Stadia method, tangential method and subtense bar method
6. Trigonometric levelling
 - 6.1 Determination of height and distances of inaccessible objects
 - 6.2 Reciprocal trigonometric levelling
7. Contouring
 - 7.1 Characteristics of contouring
 - 7.2 Method of contouring
 - 7.3 Plotting of contours and detailing

- 7.4 Uses of contour maps
- 8. Orientation
 - 8.1 Analytical intersection and resection
 - 8.2 Two point and three points resection and their significance
- 9. Triangulation and Trilateration
 - 9.1 Principles of triangulation and trilateration
 - 9.2 Computations and adjustment of triangulation and trilateration
- 10. Computation of area and volume
 - 10.1 Area by ordinates, coordinates and double meridian distance method
 - 10.2 Volume by average end area, prismoidal formula, trapezoidal rule, and Simpson's 1/3 rule.
- 11. Photogrammetry and remote sensing
 - 11.1 Types of aerial photography
 - 11.2 Scale and coverage
 - 11.3 Relief displacement
 - 11.4 Aerial photo processing
 - 11.5 Application of aerial photograph
 - 11.6 Concept of remote sensing
 - 11.7 Types of remote sensing
 - 11.8 Image processing and interpretation
 - 11.9 Electromagnetic radiation
 - 11.10 Application of remote sensing
- 12. Global positioning system (GPS)
 - 12.1 Introduction to space geodesy
 - 12.2 Principle of GPS
 - 12.3 GPS signals and positioning
 - 12.4 Geometric coordinates and WGS 84
 - 12.5 GPS data processing
- 13. Cartography
 - 13.1 Concept of cartography
 - 13.2 Scope of cartography
 - 13.3 Conventional and digital cartography
 - 13.4 Map compilation and production
 - 13.5 Geographic and cartographic scale
 - 13.6 Topographic cartography
 - 13.7 Data acquisition, processing, analysis, visualization and presentation
 - 13.8 Map reproduction, enlargement and reduction
- 14. Geographical information system (GIS)
 - 14.1 Introduction to GIS
 - 14.2 GIS component
 - 14.3 Data model
 - 14.4 GPS data processing
 - 14.5 GIS operation and spatial analysis
 - 14.6 Geometric coordinates and WGS 84
 - 14.7 Application of GIS
- 15. Cadastral surveying
 - 15.1 Cadastral concepts
 - 15.2 Principles of cadastral surveying
 - 15.3 Cadastral survey methods
 - 15.4 Land laws
 - 15.5 Land acquisition and compensation
- 16. Geodesy
 - 16.1 Coordinate system and star coordinate updating

- 16.2 Mathematical model for latitude, longitude and azimuth
- 16.3 Transformation between local and global system
- 16.4 Celestial system
- 17. Plotting and mapping
 - 17.1 Plotting of topographic map, L-section, Cross - section
 - 17.2 Software of plotting and mapping
 - 17.3 Mapping for hydropower project
- 18. Use of survey instrument
 - 18.1 Plane table, Telescopic alidade, Compass, Level, Theodolite, EDM, Total station, GPS receiver
 - 18.2 Aerial camera, process camera, digital camera, scanner, stereo plotter, stereoscope, scribing tools, drawing equipment
- 19. Transmission line survey
 - 19.1 Route alignment survey of transmission line
 - 19.2 Profile survey of transmission line and distribution line
 - 19.3 Tower location
 - 19.4 Angle points
 - 19.5 Power line/Transmission line crossing
- 20. Tunnel survey
 - 20.1 Alignment of the centerline of the tunnel
 - 20.2 Transferring the alignment under ground
 - 20.3 Transferring the levels under ground
- 21. Digital mapping
 - 21.1 Capture and handling of digital data
 - 21.2 Conversion of raster data to vector and vice-versa
 - 21.3 Knowledge of Auto-CAD, Arch-INFO, Arch-VIEW
- 22. Construction Survey
 - 22.1 Hydropower station: Intake, reservoir, dam, powerhouse
 - 22.2 Road alignment survey: gradient, curve, cutting, filling
 - 22.3 Curve: types of curve, setting out of simple circular curve and vertical curve
- 23. Power sector development and Engineering Economics
 - 23.1 Potential of hydropower development
 - 23.2 Identification of hydropower scheme
 - 23.3 Payback period, cost benefit ratio, internal rate of return
 - 23.4 Risk analysis, tariff structure.

॥ समाप्त ॥