

Post Graduate Diploma in Geoinformatics and Remote Sensing

EXAMINATION 2019

Session 2019-20

Post Graduate Diploma in Geoinformatics and Remote Sensing

EXAMINATION 2019

SCHEME OF EXAMINATION

1. ELIGIBILITY FOR ADMISSION

Graduation in any science stream with minimum 50% marks.

2. PASS CRITERIA

For a pass in the examination, a candidate is required to obtain at least 25% in each paper and 36% marks of total aggregate marks of theory and practical papers separately.

3. CLASSIFICATION OF SUCCESSFUL CANDIDATE

Division	Total Marks
First Division	60% and above
Second Division	Above 48% and below 60%
Pass	Above 36% and below 48%
Fail	Below 36%

4. INSTRUCTIONS TO PAPER SETTER

The question paper contains 3 sections. **Section-A** consists of 10 questions (At least 3 questions from each unit of syllabus). **Section-B** consists of 9 questions (3 questions from each unit of syllabus). **Section-C** consists of 6 questions (2 questions from each unit syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

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Examination scheme

Paper Code	Paper Name	Exam Hours	Maximum Marks	Minimum Passing Marks
Paper-I	Fundamentals of Remote Sensing, Surveying & Cartography	3	100	36
Paper-II	Digital Image Processing and applications of Remote Sensing in various field	3	100	36
Paper-III	Fundamentals of Geographical Information System (GIS)	3	100	36
Paper-IV	Practical	3	100	36
Paper-V	Case Study	-	200	72

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Paper I – Surveying, Cartography and Digital Image Processing

Scheme of Examination

Maximum Marks: 100

Duration: 3 Hours

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus) Students will have to attempt all 10 Questions. Each question carries 02 Marks. **Section-B** will consists of 9 questions (3 questions from each unit of syllabus) Students will have to attempt 05 Questions, Selecting atleast 01 Question from Each Unit. Each question carries 07 Marks. **Section-C** will consist of 6 questions (2 questions from each unit of syllabus) Students will have to attempt 03 Questions, Selecting atleast 01 Question from Each Unit. Each question carries 15 Marks. The Word limit of part A, B and C are 50, 200 and 500 respectively.

Unit I

Surveying & Map Projection The Earth: its shape and size; Datum and co-ordinate systems; Geographical and projected co-ordinate system and grid system; Choice and classification of map projections; Curvature of the Earth and its effect on surveying; Trigonometrical surveying; Calculation of height & distance; Introduction to surveying instruments; Introduction to Earth System Sciences Understanding of the Earth, system concepts for Earth System Sciences, Physical Environment, Energy balance, Atmosphere ocean interaction, Surface hydrology, soil types and processes, bio geochemical cycle, Human environment interaction, remote sensing of Earth system. Principles of remote sensing, photogrammetry Fundamental concepts of Remote sensing: EMR and its interaction with matter; outline of different methods and techniques of remote sensing.

Unit II

Global Positioning System Introduction to GPS; Types of GPS; GPS satellite; data receiver and control points; Differential GPS; Sources of GPS errors; Application of GPS in surveying, mapping and navigation. Geo-Statistics, GIS & Computer programming Nature of geographical samples; types and variability of geographical data; Measures of central tendency and of variability. Correlation and regression, Discriminant functions, variograms and semivariograms, factor analysis, probability. Computer organisation, architecture and peripherals, basic concepts. Operating systems Windows; Computer programming concepts, Introduction to MS Office, Excel, Surfer, Database management, Specific applications in Geography. Introduction to GIS and its elements, geo referencing and editing of layers, Spatial information theory, raster and vector models, data model of non spatial information, digital elevation model, structuring of map data.

Unit III

Cartography History and Development of Cartography; Sources of cartographic data; Scale: types & importance; Cartographic methods and techniques for preparation of maps and diagrams; General maps: types and applications; Thematic maps: types and applications; Introduction to Digital Cartography. Cartography & Image processing Map scales, enlargement reduction, types and conversions, symbolization, Representation of statistical data on maps, introduction to SOI

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topographical maps, numbering, scale, grid reference, signs etc, study and interpretation of SOI maps, Identification of land forms from toposheets, Survey techniques. Fundamentals of GPS and its functioning.

Paper II - Fundamentals and Applications of Remote Sensing

Scheme of Examination

Maximum Marks: 100

Duration: 3 Hours

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Unit I

Introduction & Principles of Remote Sensing Basics: Definition and scope of remote sensing; History and development of remote sensing technology; Electromagnetic radiation (EMR) and electromagnetic spectrum; EMR interaction with atmosphere and earth surface; Atmospheric window and spectral reflectance curve; Resolutions in remote sensing; Types of remote sensing; Principles and applications of optical, thermal & microwave remote sensing; Introduction to hyperspectral remote sensing.

Unit II

Aerial photography Aerial photographs: types, scale, & resolution; Types of aerial cameras and photographic films; Geometry of aerial photographs; Flight planning; Impact of season, time, & topography on aerial photographs; Parallax, relief displacement, and orthophotos.

Unit III

Image Interpretation & Applications of Remote Sensing Elements of visual image interpretation; Aerial photos vs. satellite imagery; Application of remote sensing in (a) Land use/ land cover mapping, (b) Landform analysis, (c) Resource evaluation, (d) Natural hazards assessment, and (e) Urban & regional planning.

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Paper III - Fundamentals of Geographical Information System

Scheme of Examination

Maximum Marks: 100

Duration: 3 Hours

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus) Students will have to attempt all 10 Questions. Each question carries 02 Marks. **Section-B** will consists of 9 questions (3 questions from each unit of syllabus) Students will have to attempt 05 Questions, Selecting atleast 01 Question from Each Unit. Each question carries 07 Marks. **Section-C** will consist of 6 questions (2 questions from each unit of syllabus) Students will have to attempt 03 Questions, Selecting atleast 01 Question from Each Unit. Each question carries 15 Marks. The Word limit of part A, B and C are 50, 200 and 500 respectively.

Unit I

Introduction to GIS Definition of GIS, History and development of GIS, Components of GIS, Hardwares and Softwares, GIS operations, Future of GIS.

Unit II

Basic GIS Representation of Geographic features in Raster and Vector data model: Advantages and Disadvantages; Point, line and polygon; Concept of Arc, node and vertices; Spatial data input: Digitization and Conversion, Digitization errors; Topology: Error and editing; GIS data quality: errors, policies.

Unit III

GIS Applications Applications of GIS in Urban and Regional planning, Water resource management, Soil resource Management, Forestry and Environment, Public utilities.

Paper IV - Practical

Scheme of Examination

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Maximum Marks: 100

Duration: 4 Hours

- **Surveying, Cartography and GPS Practical in Surveying**
1. Introduction to Surveying
 2. Theodolite surveying
 3. Dumpy level surveying
 4. Introduction to Advance Surveying
 5. Total station Surveying
 6. Practical in Cartography:
 7. Introduction to Map Scale
 8. Vertical exaggeration of map
 9. Enlargement and reduction of map
 10. Map Projection
 11. Introduction to SOI topographical maps
 12. Interpretation of SOI maps
 13. Preparation of Choropleth, Isopleth and Dot maps
 14. Relief representation techniques
 15. Study and Interpretation of Cadastral and thematic maps
 16. Practical in GPS
 17. GPS instrument
 18. Basic functions
 19. GPS surveying
 20. Transfer of data in software
 21. Introduction to DGPS
 22. Studies & Topographical maps at different Scale
 23. Base map Preparation using different Topomap of SOI
 24. Area calculation of Base maps using dot grids at different Scale
 25. Setelite Data study at diffrent scale at different seasons
 26. Landsuse/Land cover area preparation at different scale using visual interpretation and Interpretetion Key
 27. Area calculation of Landuse/Land cover maps at different scale
 28. Data collection using GPS
 29. Data registration Map to Satellite and Satellite to Satelite data
 30. Open source QGIS software - Basic exerises

Paper V- Project work

Maximum Marks: 200

The students should formulate a new topic related to course of their own in consultation with concern supervisor and are required to inform the department for validity of the topic before undertaking any substantive research work. You need to submit one copy of the project work in spiral bound form. Project work should be enclosed along with filled in examination application form within the dates notified in the examination schedule.