APPENDIX -13 (R)

INSTITUTE OF DISTANCE EDUCATION

UNIVERSITY OF MADRAS
B.Sc. DEGREE COURSE IN GEOGRAPHY

REVISED REGULATIONS
(Non- Semester)
(With effect from the academic year 2011-2012 onwards)

1. INSTRUCTION

Candidates offering Branch VIII B.Sc Geography shall offer any two of the following ALLIED Subjects

1. Applied Statistics, 2. Geology, 3. Environmental Science.

Candidates offering Branch VIII B.Sc Geography shall offer any one of the following APPLICATION ORIENTED SUBJECTS (AOS) in the third year

1. Geography of Health Care
2. Demographic Studies
3. Geography of Tourism

2. ELIGIBILITY FOR ADMISSION:

Candidates for admission to the first year of the Degree of Bachelor of Science in Geography shall be required to have passed the higher secondary Examinations (Academic or Vocational stream) conducted by the government of Tamil Nadu or an Examination accepted as equivalent there of by the Syndicate of the University of Madras.

Provided that candidates for admission into the specific main subject of study shall also possess such other qualifying conditions as may be prescribed by the university

3. ELIGIBILITY FOR THE AWARD OF DEGREE:

A Candidate shall be eligible for the award of the degree only if he/she has undergone the prescribed course of study in institute of distance education for a period of not less than three academic years.

4. DURATION:

The duration of the course is three academic years. At the end of each academic year shall be an examination in the papers prescribed for FIRST, SECOND and THIRD years.

5. COURSE OF STUDY:

The main subject of Study for Bachelor Degree shall consist of the following and shall be in accordance with APPENDIX.

(1) FOUNDATION COURSES: The course shall comprise the study of:

(a) PART-I Tamil or any other modern (Indian or foreign) or Classical languages: and

(b) PART-II English

(2) CORE COURSES: (consisting of (a) Main Subjects /Practical, etc. if any ;
(b) Allied Subjects; and (c) Application Oriented Subjects related to the Main Subject of Study).

6. SCHEME OF EXAMINATIONS

FIRST YEAR

Paper	**Paper Title**	**Hours**	**Marks**
	Language-I paper-I Language-II paper-I	3 3	100 100
	Allied-I: Paper-I	3	100
	Major		
I	Fundamentals of Physical Geography – I	3	100
II	Practical I: Cartography – Fundamental Exercises.	3	100 Exam 60 Record 40

SECOND YEAR

	Language-I paper-II Language-II paper-II	3	100
	Allied-II: Paper-II	3	100
III	**Major:** Fundamentals of Physical Geography – II	3	100
IV	Practical II: Representation of Relief, Climatic and Economic Data (4 days compulsory practical classes and 5th day Examination)	3	100 Exam 60 Record 40

THIRD YEAR

Paper	Paper Title	Hours	Marks
AOS	Paper I	3	100
V	**Major:** Geography of India	3	100
VI	Basics of Remote Sensing	3	100
VII	Basics of Geographical Information Systems (GIS)	3	100
VIII	World Regional Geography	3	100
IX	Practical III: Map and image Interpretation, Surveying, weather maps and GPS (4 days compulsory practical classes and 5th day Examination)	3	100 Exam 60 Record 40

Note: Geography(Major): 4 days compulsory practical classes and 5th day examination.
Ancillary Subjects: 3 days compulsory practical classes and 4th day examination.

7. REQUIREMENTS FOR PROCEEDING TO SUBSEQUENT YEARS:

(i) Candidates shall register their names for the first year examination after the admission in the UG Courses.

(ii) Candidates shall be permitted to proceed from the first year upto final year irrespective of their failure in any of the first and second year examinations subject to the condition that the candidates should register for all the arrear subjects of earlier years along with current (subsequent) year subjects.

8. PASSING MINIMUM:

A candidate shall be declared to have passed in each paper/practical of the main subject of study wherever prescribed, if he/she secures NOT LESS THAN 40% of the marks prescribed for the examination. He/she shall be declared to have passed the whole examination, if he/she passes in all the papers and practicals wherever prescribed as per the scheme of examinations.

9. CLASSIFICATION OF SUCCESSFUL CANDIDATES:

Foundation Course:

A] Languages other than English: Successful candidates passing the examination for the LANGUAGE papers and securing the marks (i) 60% and above and (ii) 50% and above but below 60% in the aggregate shall be declared to have passed the Examination in the FIRST and SECOND CLASS respectively. All other students shall be declared to have passed the examination in the THIRD CLASS.

B] **English:** Successful students passing the examination for the ENGLISH and securing the marks (i) 60% and above and (ii) 50% and above but below 60% in the aggregate shall be declared to have passed the examination in the FIRST and SECOND CLASS respectively. All other students shall be declared to have passed the examination in the THIRD CLASS.

CORE COURSES: Main, Allied and Application Oriented Courses: Successful candidates passing the examination for the Subjects MAIN, ALLIED AND APPLICATION ORIENTED

COURSES papers together and securing the marks (i) 60% and above and (ii) 50% and above but below 60% in the aggregate shall be declared to have passed the examination in the FIRST and SECOND CLASS respectively. All other students shall be declared to have passed the examination in the THIRD CLASS.

Candidates who obtain not less than 75% of the marks in the aggregate shall be deemed to have passed the examination in the First Class with Distinction provided they pass all the examinations prescribed for the courses in the first appearance.

10. RANKING

Candidates who pass all the examinations prescribed for the course in the FIRST APPEARANCE ITSELF ALONE are eligible for Ranking/Distinction, provided in the case of candidates who pass all the examinations prescribed for the course with a break in the First appearance due to reasons as furnished in the Regulations under REQUIREMENTS FOR PROCEEDING TO SUBSEQUENT YEAR are only eligible for Classification.

11. TRANSITORY PROVISION:

The syllabus along with the various regulations shall come into force for the admissions made in the academic year 2011-2012 and thereafter. Candidates who have undergone the course of study prior to the academic year 2011-2012 will be permitted to appear for the examinations under those regulations for a period of three years.

12. PATTERN OF QUESTION PAPER:

Part-A
Short Questions 10 ×2 = 20
All Questions are Compulsory

Part-B
Paragraph Type Questions
Any five out of eight questions 5×8 = 40

Part-C
Essay Type Questions
Any two out of three questions. 2×20 =40

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A.C.F.11.

APPENDIX - 13 (S)
UNIVERSITY OF MADRAS
INSTITUTE OF DISTANCE EDUCATION

B.Sc. DEGREE COURSE IN GEOGRAPHY

REVISED SYLLABUS
(Non- Semester)
(With effect from the academic year 2011-2012 onwards)

FIRST YEAR

Paper- 1- Fundamentals of Physical Geography – I

Unit 1: Origin of Earth – The Solar System- Age of the Earth – Structure of the Earth's interior – Earth Movements - Rocks-types and classification-Igneous, sedimentary and metamorphic rocks, folding, faulting, earthquake and volcanoes

Unit 2: Forces of gradation and weathering-mechanical and chemical weathering, mass wasting and mass movement.

Unit 3: Agents of Gradation-Fluvial processes, Erosion, Transportation, deposition, resultant topography, glacio fluvial action-erosion and depositional work at the glaciers-resultant topography.

Unit 4: Aeolian landscape-erosion-depositional work of the wind-resultant topography, wave action-erosive work of the waves, depositional work of the waves-shorelines of submergence and emergence.

Unit 5: Underground water-water table-spring and their types, karst topography, normal cycle of erosion-Davis, Penk.

References

1. Workcester, 1965, Text book of Geomorphology
2. Arthur L. Boom, 1978 – Geomorphology
3. Monkhouse F.J, Principles of physical geography
4. Wollridge and Morgan – An Outline of Geomorphology
5. Das Gupta and Kapur, 1955 – Physical Geography

Paper II- Practical - 1- Cartography (Fundamental Exercises)

Unit 1: Definition-Nature and Scope of cartography-Maps, Classification and uses- Development of Cartography- use of Thematic Cartography - The earth as a Cartographic problem- shape, size and dimension-co- ordinate systems.

Unit 2: Maps: definition of a map-Types of maps-representation of scale on the map: statement scale-graphic scale-Representative Fraction; Comparative scale-pace scale-time scale-diagonal scale - Map scale-determination of map scales- enlargement and reduction- direction.

Unit 3: Measurement of distances on maps: Latitudes and longitudes, Instrumental method-thread method; measurement of areas: graphical method-instrumental method - Enlargement and reduction of maps- square method and similar triangle- reduction by pantograph- combination of maps of different scales.

Unit 4: Map data: collection and classification- compilation and generalization of map information- compilation processes- principles of generalization - Map symbolization- point, line, and area symbols-qualitative and quantitative method.

Unit 5: Representation of direction on maps; true north grid magnetic north-magnetic declination- bearings- true bearing and magnetic bearing-map setting in the field-map reading.

References

1. Robinson, H. Elements of Cartography, Students friend, Allahabad, 4th Ed. John Wiley, New York.
2. Misra, R. P. and Ramesh, A., Fundamentals of Cartography, Heritage Co., Delhi.
3. Monkhouse, F.J. and Wilkinson, H.R. Maps and Diagram, Meuthun & co., London
4. Rangunandhan Singh, Practical Geography
5. Singh, R.L. and Dutt, P.K. Elements of Practical Geography
6. Bygott, Practical Geography
7. Johnson and Ormsby, Surveying and Map reading

Allied I Paper – I - APPLIED STATISTICS

Theory: 50 marks

Unit – 1:

Nature and scope of statistical methods and their limitations and their application in Geography –Spatial data and statistical methods –Classification, tabulation and diagrammatic representation of various types of statistical data –Frequency curves and gives –Graphical determination of percentiles, quartiles and their uses- Lorenz curve.

Measures of location and dispersion (relative and absolute) - Skewness and Kurtosis.

Unit- 2:

Probability of an event- Finitely additive probability space –Addition and multiplication theorems –Independences of events –Conditional probability –Baye's theorem –Concepts of random variable –Mathematical expectation –Moments of random variable –Simple problems.

Unit –3:

Bivariate frequency table and its uses –Scatter diagram –Regression lines –Linear prediction –Rank correlation coefficient –Curve fitting by method of least squares –Standard distributions –Binomial, Poisson and normal distributions –Fitting of distributions.

Unit- 4:

Concept of sampling distributions –Standard error –Tests of significance based on it, Che-square and F distributions with respect to mean, variance and correlation coefficient –Theory of attributes and tests of independence in contingency tables.

Unit –5:

Sampling from finite population –Simple random sampling –Stratified and systematic random sampling –Procedures –Estimation of mean and told and their standard errors –Concept of sampling and non-sampling errors.

Principle of scientific experiments –Randomization replication and local control –Analysis of variance –One way and two way classifications –Analysis of CRD and RRD Latin square designs – Concept of factorial experiments (without confounding).

Note: The emphasis is solely upon the application and understanding and practice of statistical methods, with specific reference to problems in earth sciences.

References:

1. Wonnacott, R.J. and Wonnacott,T.H. (1985): Introductory Statistics, 4th ed.,John Wiley & Sons.&
2. Freund, J.E. and Williams, F.J. (1977): Elementary Business Statistics – The Modern Approach, Prentice Hall.
3. David, Ebdon (1977):Statistics in Geography –A Pratical Approach, Basil Blackwell, Oxford.
4. Gegory, S. (1964): Statistics Methods and Geographer, Longman, London.
5. Wilks, S.S.: Elementary Statistical Analysis, Oxford and IBH.
6. Snedecor, G.W. and Cohran, W.G.: Statistical Methods, Oxford and IBH.
7. Simpson and Kafka: Basic Statistics.
8. Burr, I.W.: Applied Statistical Methods. Academic Press.
9. Aslam Mahmood and Moonis Raza (1977) : Statistical Methods in Geographical Studies, Rajesh Publication. New Delhi.
10. Hammond, R. and McCullah, P. (1974) : Quantitative Techniques in Geography –An Introduction,Clarendon press, Oxford.
11. Science in Geography Series (i-iv) : Oxford University Press, London :
    (i) Development of Geographical Methods.
        i. (ii)Data Collection.
        ii. (iii)Data Description and Presentation.
        iii. (iv)Data Use and Interpretation.

APPLIED STATISTICS- PRACTICAL

Marks: 50

Note: Use of Calculators may be permitted for Applied Statistics Practical examination. Statistical and Mathematical Tables will be provided to the students.

1. Construction of univariate distribution with sample size not exceeding 200-Diagrammatic and graphical representation of data.
2. Numerical computation of Measures of central tendency-Measures of dispersion (relative and absolute) Measures of skewness.
3. Fitting of binomial, Poisson distributions and testing of goodness of fit.
4. Computation of correlation coefficients-regression lines- Rank correlation coefficient.

5. Curve fitting by the method of least squares.
   $Y= ax+b$, $y=ax^2+bx+c$,
   $Y=ae^{bx}$, $y=ax^b$, $y=ab^x$.
6. Asymptotic and exact tests based on normal, T and F distributions.
7. Chi-square test for independence of attributes and its application to Biological studies.
8. Analysis of variance-one way and two way classification.
9. Analysis of C.R.D., R.B.D and L.S.D.
10. Non-parametric tests.

Practical Examination: 40 Marks
Record of Practical's: 10 Marks

Paper –III- Fundamentals of Physical Geography-II

Part- A Climatology

Unit 1: Definition-weather, climate, climatic elements-surface composition and structure of the atmosphere-insolation, Horizontal and vertification distribution of temperature, range of temperature

Unit 2: Atmosphere Pressure-winds-horizontal distribution of pressure, planetary-periodic and local winds. Atmospheric moisture condensation, Forms of precipitation-types

Unit 3: Air masses and fronts- concepts-classification-cyclones-tropical-anti cyclones-climatic classification-koppens- Basic of classification and types.

Part- B Oceanography

Unit 4: Surface configuration the ocean floor- continental shelf, slope, deep, sea plain and deeps- distribution of salinity in the seas and oceans.

Unit 5: Circulation of oceanic water-waves, tides and currents-currents of the Atlantic, pacific and Indian Ocean-Coral reefs-types – Coasts - Importance of Coast – Coastal Pollution – Coastal Regulation Zone.

References

1. Richi, H. (1954): Tropical Meteorological, McGraw Hill Book Co., Ltd., New York.
2. Garbell M.A., (1947): Tropical and Equatorial Meterology, Bitman Publishing Corporation, New York
3. Trewartha , G.T. (1968): An Introduction to climate, McGraw Hill Book, Co., New York.
4. J.E.Hobbs, Applied Climatology, Butterworths, London.
5. R.C. Sharma and M. Vatal (1987); Oceanography for Geographers; Chaitanya Publishing House, Allahabad.
6. Tom Garrison (1996); Oceanography – An Invitation to marine science; Wadsworth Publishing co., Washington.

Paper –IV- Practical II – Representation of Relief, Climatic and Economic Data

Part-A: Representation of Relief Data

Unit 1: Representation of relief on maps: spot heights, bench mark, triangulation station, layer coloring, hachure, hill shading and contours- interpolation of contours; contour exercises - Contour Diagrams - section drawing.

Unit 2: Slope maps and slope analysis - Profiles - Spot Height and Interpolation of Contour.

Part- B: Representation of Climatic Data

Unit 3: Diagrammatic representation of climatic data- climatic diagrams- Hythergraph –Climograph-Ergograph-Wind Roses - Study of weather reports and weather map interpretation - Study of weather symbols, Weather data and codes-station, model, study and interpretation of Indian weather reports interpretation of weather reports according to seasons-study of cyclonic tracks.

Unit 4: Representation of economic and population data-line graph-bar diagram-pie diagram- spheres-block piles - Located diagrams-bars –climatic graphs-dot maps and pie maps-isopleth, Choropleth-Stendigeer and Stilgenbauer, pyramidal and pictorial diagrams.

Part- C Representation of Economic Data

Unit 5: Quantitative methods-histogram-frequency polygon, frequency curve-scatter diagram-mean, median and mode-standard deviation - Correlation: Pearson's product moment Correlation-Rank Correlation.

References

1. Monkhouse, F.J. Maps and Diagrams, Meuthun & Co., Ltd., London.
2. Hugh Mathew & Lan Foster, Geographical Data: Sources Presentation, Oxford University Press, Oxford, 1989.
3. Macullah, Quantitative Techniques in Geography
4. Rahunathan, Singh, Practical Geography
5. Singh, R.L & Dutt, Practical Geography

Allied II Paper -II- GEOLOGY

Theory: 50 marks

UNIT-1:

Study of the solar system-An outline of Nebular and Planestesmal hypotheses of the origin of solar system-An outline of the constitution and composition of the interior of the earth-An outline of the important methods of determining the age of the earth-Earthquakes and their effects- A simple type of Seismograph-Seismogram-Modern scale of intensity of earthquakes-Concept of continental drift-Wegner's hypothesis.

Definition of Dip and Strike-Distinction between true dipe and apparent dip-Folds: Symmetrical and Asymmetrical; Anticline and Syncline-Faults: Normal fault, Strike fault, Dip fault, Oblique fault, Horst and

Graben -Description of Simple types of joints ,Strike joints ,Dip joints ,Oblique joints and Bedding joints-Definition of unconformities-Description of angular unconformity , disconformities and non-conformity.

UNIT-2:

Definition, Mode of preservation and uses of fossils – morphological characteristics of the following: Pelecypods, Gastropods, Cephalopods, Brachiopods, Trilobites and Corals.

Laws of Stratigraphy-Geological time scale- An outline of the following formations in India: Dharwar system of Karnataka, Cuddapah system, Vindhyan system, Gondwana system, Triassic of spiti, Jurassic of Kutch, Cretaceous of Trichinopoly, Deccan traps and Siwalik system

UNIT-3:

Crystallography: Definition of Crystal-Morphological characters of Crystals-Faces –Forms-Edges-Solid angles-Crystal Symmetry-Axes of symmetry, Plane of Symmetry and centre of symmetry-Parameters and Miller's indices-Study of the Normal classes of all the systems.

Descriptive Mineralogy: Definition, Physical Properties and Description of the following:

Quartz and its varieties, Orthoclase, Microcline, Albite, Oligoclase, Andesine, Debradorite, Bytownrite, Anorthite, Nepheline, Leucite, Sodalite, Hornblende, Augite,Aegerine, Olivine, Serpentine, Muscovite, Biotite, Epidote, Chlorite, Tale, Topaz, Beryl, Tourmaline, Apatite, Garnet, Staurolite, Sillimanite, Calcite, Dolomite and Corundum.

UNIT-4:

Igneous Rocks: Extrusive form of igneous rocks; Block lava, Ropy lava-Vesicular Structure-Amygdaloidal, Structure, Intrusive forms: Sill, Laccoliths, Dyke, Batholiths, and Textures- Megascopic classification- Description of the following:

Granite, Pegmatite, Graphic Granite, Aplite, Syenite, Diorite, Gabbro, Norite, Dunite, Pyroxenite, Anorthosite, Dolarite, Basalt, Trachyte, Andesite, Rhyolite, Dacite, Obsidian, Pumice and Scoria.

Sedimentary Rocks-Primary sedimentary structures: Graded bedding, Current bedding, Cross Bedding, Ripple marks. An outline of megascopic classification of Sedimentary rocks-Description of the following: Conglomerate, Sandstone, Arkose, Grit, Shale and Limestone.

UNIT- 5:

Metamorphic rocks- Agents and kinds-Descriptive study of the following-Slate Phyllite, Schist, Gneiss, Quartzite, Marble, Charnokite and Amphibolites.

Description of the following: Asbestos, Kaolin, Chalk, graphite, Bauxite, Magnesite, Barite, Calcite, Dolomite, Gypsum, Limonite, Magnetite, Haematite, Limonite, Chromite, Pyrolusite, Psilomelane,Pyrite,Chalcopyrite,Galena Sphalerite,Gold. Monazite, Peat, Lignite, Bituminous, Coal and Anthracite. A short account on the occurrence of Petroleum and its origin.

Reference Books:

(1) Miller, W.J. 1949- An Introduction to Physical Geology.
(2) Mukherjee, P.K. 1984- A Text book of Geology.
(3) Parbin Singh 1985-Text book of Engineering & General Geology.
(4) Billings, M.P.1979-Structural Geology, New Delhi.
(5) Read, H.H. 1960-Rutley's Elements of Mineralogy, Thomas Murray & Co., London.
(6) Tynell, G.W.1926-Petrology.
(7) Wooda, H.1959-Invertabrate Paleontology.
(8) Black, R. N. 1972- The Elements of Paleontology.
(9) Sharma, N.L. and Ram, K.S.V. 1964-Introduction to India's Economic Minerals, Dhanbad Publications.

Allied –II Paper - II
GEOLOGY-PRACTICAL

Crystallography:

Study of all the simple forms and the following combinations of the normal classes of all the systems:

Isometric System: Cube and Octahedron (Galena); Cube and Tetra hexahedron (Fluorite); Cube and Trapezohedron (Analcite); Octahedron and Trapezohedron (Spinal); Dodecahedron and Trapezohedron (Magnetite).

Tetragonal System: I order prism and I order Pyramid (Zircon): II order prism and I order pyramid (Apophyllite); I order pyramid and II order pyramid (Cassiterite); I order prism and II order prism and I order Pyramid (Vesuvianite).

Hexagonal System: I order prism and base (Beryl); II order prism and base (Beryl); Dihexagona prism and base.

Orthorhombic System: Macropinacoid, Brachy pinacoid and Basal Pinacoid. Prism and Basal pinacoid, Macrodome and Brachy pinacoid; Brachydome and Macropinacoid; Prism and Base (Barite).

Monoclinic System: Ortho-Clinic- and Basal pinacoids; Prism and Basal pinacoid; Orthodomes and Clinopinacoid; prism and pyramid (Gypsum).

Triclinic System: Macropinacoid, Brachy pinacoid, and Basal pinacoid; Macro-pinacoid, Brachy pinacoid Prism and Basal pinacoid (Kyanite).

Mineralogy: Identification and description of the following minerals:Rock crystal, Amethyst, Rosy quartz, smoky quartz, Chalcedony, Agate, Jasper, Orthoclase, Microcline, perthite, Amazonstone, Albite, Labradorite, Hornblende, Hypersthenes, Augite,Olivine, Serpentine,Muscovite,Biotite,Chlorite, Talc,Beryl,Tourmaline, Apatite,Garnet,Staurolite,Calcite, Dolomite,Apophyllite, Stilbite,Corundum, Asbestos, Kaolin, Chalk, Graphite, Bauxite, Magnesite, Malachite, Barite, Gypsum,Magnetite, Haematite,Chromite, Pyrolusite, Psilomelane, Pyrite, Chalcopyrite, Galena, Monazite Peat, Lignite, Bituminous Coal and Anthracite

Rocks: Identification and description of following:Granite, Pegmatite, Apatite, Rhyolite, Obsidian, pitchstone, Syenite, Trachyte, Gabbro, Dolerite, Basalt, Dunite, Pyroxenite, Anorthosite, Conglomerate, Breccia, Standstone, Shale, Limestone, Slate, Phyllite, Amphibolite, Quartzite, Marble, charnockite, Chlorite Schist, Hornblende gneiss, Augen gneiss and Garnetiferous mica gneiss.

Maps: Exercise concerning relation between topography and attitude of beds, Outcrop, filling, of simple conformable, series, preparing sections of conformable beds, Reading of Geological maps.

Fossils: Identification and description of the following:Meretrix, Arca, Cardium, Pecton, Unio Cryphaca Exogyra, Alcetryonia, Trigonia, Inoceramus Turritella Natica, Turbo, Fusus Conus Murex, Physa, Ballerohen Orthoceras, Nautilus, Ceratiles Acanthoceras, baculities. Belemnites Products Spirifier, Terebratula Zaphrentis, Calecola, Lithostrotion Calymene.

Practical Examination: 40 Marks
Record of Practical's: 10 Marks

Paper – V- Geography of India

Unit 1: India as geographical unit –India's location –Physical contrasts- Physiography-relief, Coasts and islands-Climate: seasons-temperature and rainfall-Indian monsoon-climatic regions - water resources of India: rivers-distribution and development of irrigation; tanks, canals, wells and tube wells-major irrigation and multipurpose river valley projects.

Unit 2: Soils-types and distribution-soil erosion and conservation-natural vegetation-forests; types-forest as a resource: agriculture: major food crops and regions-rice, wheat and millets, plantation agriculture-sugarcane, tobacco, jute, cotton, groundnut, castor and mustard-agricultural regions - Problems of Indian Agriculture-livestock wealth of India-Indian fisheries.

Unit 3: Mineral resources: Iron Manganese,Bauxite,Limestone,copper,Zine and Gold-distribution and Production-power resources:coal,oil,hydro –electricity, thermal and atomic power development distribution and production,industries:Agro-based industries-Textiles-cotton,jute,woolen-sugar

Unit 4: Metallurgical industries: Iron and steel, aluminium, engineering and machine tools, automobiles and locomotives, ship building, chemical industries, paper and fertilizer - Transport: Roadways - Railways and Airways-trade: Inland and foreign-export and import - Population: distribution and density-rural and urban growth-migration.

Unit 5: Tamilnadu: Physiography-climate-drainage-soil and natural vegetation-agriculture: distribution of paddy, sugarcane and millets-plantation agriculture - Distribution of minerals and industries-population: distribution density and growth.

References

1. Gopal Singh, 1970, Geography of India, Atma Ram Nad Sole.
2. Singh, R.L. India, A Regional Geography, UBS Publishers and Distributors Ltd., Seena Publication
3. Spate, O.H.K. India and Pakistan
4. Sharma Economic Geography of India
5. Singh and Memoria Geography of India
6. Dubey, R.N. 1971, Economic Geography of India.

Paper –VI- Basics of Remote Sensing

Unit 1: Remote sensing - Definition – Development – Origin and Development of Remote Sensing - Sensors – Resolution and it types – Principles of Aerial and Satellite Remote Sensing - Uses of Satellites and Remote Sensing.

Unit 2: Electro Magnetic Radiation Spectrum – Sources of Electromagnetic Energy – Energy Sources and Radiation Principles – Electromagnetic Spectrum.

Unit 3: Platforms – Types of Platforms - Satellite and Remote Sensing - Sensors – Data Acquisition and Interpretation of Digital Data - Data products.

Unit 4: Development of Remote Sensing in India – ISRO – SAP – NRSA – Future Programmes.

Unit 5: Remote Sensing: Scope and advantages- Types of environmental remote sensing- Satellite remote sensing-remote sensing applications.

References

1. Arthur, H. Robinson, Joel L.Morrison, Phillip C.Muekrcke, A John Kimerbling – Elements of Cartography, 6th Ed., John Wiley and Sons, New York.
2. George Bokorte, The GIS Book, 5th Ed. Onward Press.
3. Paul J.Curran, Principles of Remote Sensing, ELBS.

PAPER-VII- Basics of Geographical Information System (GIS)

Unit 1: Introduction: Geography and Computer Applications: purpose, interacting with computer, storing information, network and data communications-computer software: The operating System, Word Processing, and desk top publishing, spread sheet concepts.

Unit 2: Database: Definition, over view, components of data base, database applications-data base and management system; Data base and Information Systems; Cartographic data bases and GIS.

Unit 3: G.I.S - Concept of GIS - Components of GIS - GIS data types - GIS and map design layout.

Unit 4: GIS analysis - GIS software and hardware - GIS applications.

Unit 5: GPS – GPS Survey Methods and Integration with GIS Technology – GPS Survey methods – Case Studies.

References

1. A.H.Robinson, Elements of Cartography, 6th Edition, John Wiley, New York.
2. Misra, R.P., and Ramesh, A Fundamentals of Cartography, Heritage Col., Delhi.
3. Monkhouse, F.J. and Wilkinson, H.P., Maps and Diagram, Methuen & Co., Lt.d, London

Paper –VIII- World Regional Geography

Unit 1: Definition of region - Regions-Development of regional concept - Formal and functional regions - regional Hierarchy Physical elements - Space relationships- World regions: Major climatic regions of the world - Natural vegetation - forest, grasslands, desert.

Unit 2: Population: Human elements-population- cultural features - Factors influencing the distribution and density of population- growth of world population-factors affecting the growth of population in the-birth and death rates population explosion – Economic activities – Settlements: Rural settlement- sitting factors of rural settlement, rural settlement types and pattern- Urban Settlement: Factors - Classification according to size and functions-Nelsons, Harris Classification.

Unit 3: Agriculture: Farming in the world shifting subsistence commercial and plantation farming – mixed farming-horticulture - market gardening- production and distribution of rice, wheat, sugarcane, coffee, tea, cotton and jute-major forest types and distribution, conservation of forests - Animal husbandry in the world-fisheries – types - problem in fishing and conservation measures.

Unit 4: World minerals mining-Iron ore-bauxite-manganese-copper-power resources coal, petroleum, natural gas, atomic minerals-major region of hydel power generation-conservation of power resources-manufacturing industries of the world - localisation factor-Iron and steel-textiles-chemicals-automobiles - ship building.

Unit 5: Transport system – road – rail – airways-water ways-major ports and airports of the world- international trade routes of the world-trade-national – international trade –modern trade development.

References

1. Oliver, H. Heintzelman, Richard M. Highsmith, J.R. (1965), World Regional Geography – Printice Hall of India (P) Ltd., New Delhi.
2. Roger Minshulli (1967), Regional Geography: Theory and Practice, Hutchinson University Library, London.

Paper – IX- Practical III – Map and image interpretation, Surveying, weather maps and GPS

Unit 1: Signs and symbols used in topographical maps, Topographical maps and their referencing by quarter inch, half inch and one inch maps of Survey of India.

Unit 2: Cartographic description of survey of India, Cartographic description of Ordinance Survey, United States Geological Maps - Interpretation of 1:50,000 topographical maps of survey of India (maps highlighting of typical landforms including drainage and coastal areas and cultural features should be done).

Unit 3: Simple methods of surveying: surveying with chain-open and closed traverse, prismatic compass-Recalculation of bearing-Bowditch method of correction of closing error - Plane table survey - open and closed traverses-resection by two point and three point method, Abney level-Indian clinometer height determination by accessible and inaccessible, Aerial photo interpretation.

Unit 4: Definition of Map Projection - Purpose of Map Projections, Graphical construction and properties of the map projection, Zenithal projection-equidistant, equal area, gnomonic and stereographic or Orthomorphic projections - Cylindrical projection: equidistant, equal area and Mercator's projection; conical projection; one standard and two standard parallels-Bonne's projection and Polyconic projections - Conventional (whole world) Projections-Sinusoidal and Mollwids Projections.

Unit 5: GIS-Raster Encoding, GPS-Location and Routing

References

1. Raghunandan Singh, Practical Geography
2. Kentkar, Elements of Surveying
3. Austin Miller, Skin of the Earth
4. Monkhouse, F.J. Maps and Diagrams
5. Her Majesty Publications, Map Reading
6. Radhunandan Singh, Practical Geography
7. Johnson and Ormsby, Surveying and Map Reading
8. Singh and Dutt, Practical Geography
9. Monkhouse, Maps and Diagram

APPLICATION ORIENTED SUBJECTS

CANDIATES OFFERING SHALL OFFER ANY ONE OF THE FOLLOWING APPLICATION ORIENTED SUBJECTS IN THIRD YEAR.

1. **Geography of Health Care**
2. **Demographic Studies**
3. **Geography of Tourism.**

GEOGRAPHY OF HEALTH CARE

Unit 1: Medical Geography-Introduction-Scope-Contents-components of medical geography - Environment and diseases-water borne diseases-air borne diseases-mineral enrichment and deficiencies-diseases.

Unit 2: Diseases and society-Environment types- Physical-social-Economical-Cultural –Sanitation-environmental- Hygiene and Health, Social and Cultural norms and Practices – Role of private, Public and institutions in Health.

Unit 3: Society and health-Sanitation, modernization, western way of living and emerging health issues - Ecology and diseases-diseases epidemics-communicable and contagious diseases - Epidemiology and Disease - Epidemic – Endemic- water borne – Vector Borne.

Unit 4: Mapping of Disease- disease related data- disease analysis – disease mapping - Natural Hazards-disasters calamities and health problems.

Unit 5: Health planning-Health care centers and planning-Family and community health planning - Health and health care systems in Tamil nadu.

References

1. Learmonth, Andew (1978). Patterns of Disease and Hunger – A Study in Medical Geography, David and Charles, London.
2. Misra R.P. (1969). Medical Geography of India, N.B.T. New Delhi.
3. Howe, M. and Loraine (Eds.) Environmental Medicine (2nd Edition), William Jeinemanu
4. Pyle, G.F. (1979) Applied Medical Geography, WHO, Winston-Sons, Washington, D.C.

DEMOGRAPHIC STUDIES

Unit 1: Demography-Scope, contents and trends, relevance of demographic studies - Demographic studies and its applications.

Unit 2: Population Information-census and sample surveys-fertility services-house hold surveys - Study of demographic structure-population distribution and structure-Age –sex variation.

Unit 3: Ethnicity-literacy structure-occupation differences-Income variation - Growth Dynamics-Growth estimation Impacts of death and birth growth.

Unit 4: Population movements-rural-urban movements, intra-national and international migrations-migration and growth - Population dynamics-Demographic transition-mortality factors-population changes.

Unit 5: Demographic planning and problems: Population problems-planning in developed and developing countries - Demographic studies: policies-population resources-Population geography in the 21st century

References

1. Clark, I. (1964) Geography of Population: Approaches and Applications, Pergamon Press, Oxford, U.K.
2. Chandna, R.C. (1984), A Geography of Population, Kalyani Publishers, New Delhi.

GEOGRAPHY OF TOURISM

Unit 1: Tourism-Definition-Development of tourism-mode of tourism: origins destinations, Transit-Factors of tourism - Physical, Historical, socio-cultural, economic, environmental, Education, political, recreational, Natural wonders.

Unit 2: Types of tourism: cultural tourism, eco tourism, adventure tourism, heritage tourism-measurement of tourism phenomena - the need for measurement-problems of measurement-method of measurement-Tourist statistics.

Unit 3: Components of tourism industry-travel, hospitality, visitor's services-distance, modes, cost-culture and hospitality-food, beverages-stay and accommodation - accommodation-types of accommodation, Chain accommodation, time sharing-tours, tour operators-private and public tourism development corporations.

Unit 4: Tourism promotion-Role of advertising and publicity, audio-visual, photographs, posters, information offices-Role of handicrafts, fairs, festival, Exhibition - World Tourism Organizations-WTO, IATA, PATA, IUOTO-International tourists flows.

Unit 5: Indian tourism, major types-India as a paradise for tourists-importance of tourism in Indian economy - Consultant of tourism development-measure of promoting tourism-Tourism development in Tamil Nadu.

References

1. Maneet Kumar, (1992) "Tourism Today"
2. Michael M.Coltman (1989), "Tourism Marketing", Van Nostrand Reinfold, New York.
3. Fodder Hoddies, Fodder's Guide of India, Hoden and Strongton
4. Rosemary Burton (1995), Travel Geography, Pitman Publishing, London.

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