AWADHESH PRATAP SINGH VISHWAVIDYALAY, REWA(M.P.)

Ph.D. ENTRANCE TEST SYLLABUS

(2022)

SUBJECT- GEOLOGY

Note : Syllabus divided in two parts carries 100 marks only.

1. Part-A Research Methodology 50 Marks.
2. Part-B Related to the syllabus of the subject 50 Marks.
3. Each part (A & B) will be divided into 5 units.
4. Syllabus will be equally divided among all units.
5. There shall be no negative marking.

PART-A RESEARCH METHODOLOGY MAX. MARKS : 50

Unit: –I

1. Introduction to Research methodology.
2. Objectives, Types of research, processes and steps in Research methodology.
3. Research proposal and concept

Unit: –II

1. Research designing, meaning, need, concept and different research designs.
2. Field procedures in Geological mapping, preparation of Geological maps and their interpretations.
3. Sampling/ field method used in Earth Science/Geology

Unit: –III

1. Basic statistical methods used in Earth Science/Geology and their interpretations.
2. Methodology for Environmental impact assessment
3. Research Methodology related to hydro-geological studies.

Unit: –IV

1. Satellite data interpretation for Geological, Hydro-geological studies.
2. Structural and Disaster management studies
3. Graphical presentation of data using computer techniques

Unit: –V

1. Preparation of minor and major research project proposals.
2. Information of various funding agencies in Earth Sciences/Geology
3. Format for writing of Thesis, Reports and Research papers

BOOKS RECOMMENDEND :-

1. Research Methodology – C. R. Kothari.
2. Research Methodology – H. K. Kapil.
3. Scientific Method – Brown and Ghiseli.
4. Methods in Social Research – Goode and Hath.
5. Scientific Social Survey and Research – Young.
6. Elements of Research – Whitney.
7. Research Methodology – LN Agarwal.
8. Sodh Parichay – Bhatnagar and Rai.
9. Sodh aur Sidhanta – Nagendra.
10. Methods of Social Survey and Research – SP Bajpai.

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PART-B SUBJECT : GEOLOGY MAX. MARKS : 50

Unit –I

Earth's Interior, earthquake belts, Seismograph. Evidence of Continental Drift. Isostasy. Geosynclines. Plate Tectonics: causes of plate motion, plate boundaries. Origin of Himalayas.

Geomorphic process. Cycle of Erosion, Geomorphic Cycle, Geological work of river. Karst Topography and various landforms. Drainage Pattern, Basic idea about morphometric analysis.

Unconformities. Geometry of folds. Classification and types of folds. Geometry of faults. Classification and types of faults. Joints and its classification.

Unit-II

Classification of Silicate structures. Atomic structure, Chemical composition, Physical and Optical properties of olivine, garnet, pyroxene, silica, amphibole, feldspar, feldspathoid, mica group minerals. Principle of optics, double refraction. Concept of geochemistry and geochemical cycle, geochemical classification of elements, composition of Earth.

Textures and Structures of Igneous, Sedimentary and Metamorphic rocks. IUGS classification of Igneous Rocks, Classification of limestone and sandstones. Thermal metamorphism of impure limestone.

Unit-III

Criteria for the Stratigraphic classification and correlation. Litho-, Bio- and Chrono stratigraphic units. Geological time-scale. Achaeans of South India, Madhya Pradesh and Rajasthan, Vindhyan Supergroup, Gondwana Supergroup, Deccan Trap and Siwaliks.

Modes of fossilization, use of fossils, Morphology of Brachiopods, Lamellibranchs, Gastropods, Cephalopods and Trilobites.

Unit-IV

Control of ore deposits. Process of magmatic concentration, Hydrothermal, Placer, oxidation and sulphide supergene enrichment deposit. Important metallic mineral deposits of India, their origin, occurrence and distribution with special reference to Iron, Copper, Manganese, Diamond, Lead and Zinc. Origin and Indian occurrence of Coal and Petroleum. Surface and sub-surface exploration methods, Process of formation of mineral deposits, Controls of ore localization, calculation of ore reserves.

Unit-V

Engineering properties of rocks. Geological considerations for the selection of a dam and tunnel. Causes and prevention of Landslide.

Distribution of water. Hydrological cycle, Evaporation, precipitation and its type, origin, importance, occurrence of groundwater. Geological factors governing the occurrence of groundwater. Porosity, permeability, specific yield, specific retention, hydraulic conductivity, storage coefficient, aquifers and their classification. Groundwater quality: Physical and Chemical characteristics. Water contaminants and pollutants. Water harvesting and artificial recharge methods. Application of remote sensing and GIS in hydrogeological studies.

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BOOKS RECOMMENDED:-

1. Textbook of Physical Geology - A. Holms.
2. A Textbook of Geology - P. K. Mukerjee
3. Textbook of Physical Geology - G.B. Mahapatra.
4. Structural Geology - Twiss and Moore.
5. Geology of India and Burma - M.S. Krishnan.
6. Invertebrate Paleontology - H. Woods.
7. Principles of Invertebrate Paleontology - Shrock and Twenhofel
8. Fundamental's of Historical Geology and Stratigraphy of India - Ravindra Kumar.
9. Rutley's Elements of Mineralogy - H. H. Reed.
10. Principles of Petrology - G. W. Tyrell.
11. Igneous, Sedimentary and Metamorphic Petrology - L. A. Raymond.
12. Sedimentary Petrology - F. J. Pettijohn.
13. Principles of Geomorphology - W. D. Thornbury.
14. Geomorphology - Savindra Singh.
15. Mining Geology - Mckinstry.
16. India's Mineral Resources - S. Krishnaswami.
17. Economic Mineral Deposits - Mead L. Jensen and Alan M. Bateman.
18. Engineering Geology - D. P. Krynine and W. R. Judd.
19. Ground Water - H. M. Raghunath.
20. Ground Water Assessment, Development and Management - K. R. Karanth.
21. Environmental Geology - Kesavulu.
22. Principles and Applications of Photogeology - Shiv N. Pandey.
23. Petroleum Geology - A. L. Laverson.
24. Remote Sensing and Image Interpretation – Lillesand and Kiefer.

3/6/2022

(Prof. R. N. Tiwari)

03/12/22

(Prof. G. P. Pandey)