



Scheme
Min. Pass Marks : 36
Paper-I
Paper-II
Practical one

3 hs. duration
3 hs. duration
3 hrs. duration

5. GEOLOGY

Max. Marks : 100
Max. Marks : 50
Max. Marks : 50
Max. Marks : 50
Min. Pass Parks : 18

P. J. Das

Dr. Registrar
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Note : The paper will contain nine questions having three questions in each section. Candidates are required to attempt five questions in all taking at least one question from each section.

Paper-I : Palaeontology and Structural Geology

Section-A

Definition, Scope, sub-division, and relationship of palaeontology with other branches.

Fossils-condition necessary for preservation, modes of preservation, uses. Elementary ideas about origin of life, evolution and fossil records.

Skeletal morphology and geological distribution of following groups

Foraminifers, Brachiopods, Mollusca (Lamelibranches, Gastropods and Cephalopods-Nautiloids, Ammonoites, Dibranchia), Trilobites, Echinoids, Graptoloids and Corals.

Section-B

Gondwana Flora-morphological characters of the flora : Vertebraria, Glossopteris, Gangamopteris, Ptilophyllum.

Unconformity-its kinds, recognition in the field and geological significance. Overlap and Offlap.

Inliers and Outliers. Basic Concept of cleavages. Lineation, Joints, Salt Domes.

Section-C

Attitude of planes (Bedding Planes) and lines. Dip (true and apparent, Strike, Pitch and Plunge. Uses of Clinometer/Bed : apparent and vertical thickness. Criteria to determine top and bottom sequence, Morphology of folds and faults, their geometric and genetic classification and recognition in the field. Elementary ideas of the mechanics of folding and faulting.

Practical

Palaeontology : Identification, description and drawing of different views of the following fossils :

Nummulites, Calymene, Paradoxide, Trinucleus, Phacops, Olenus, Olenellus, Terebratulina, Productus, Spirifer, Rhynchonella, Atrypa, athyris, Lingula, Strophomena, Arca, Pecten, trigonia, Cardium, Hippurite, Venus, Lima, Inoceramus, Lophosiphonia, Gryphaea, Exogyra, Spondylus, Trochus, Conus, Nautilus, Turritella, Physa, Murex, Cypraea, Bellerophon, Nautilus, Gantatites, Ceratites.

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Syllabus : B.Sc. Part-II

Perisphinctes, Belemnite, Cidaris, Hemiaster, Glossopteris, Gangamopteris, Vertebraria, Ptillophyllum.

Structural Geology : Study of physiographic features in topographical maps and use of clinometer compass, drawing profiles and geological section along given direction.

Simple dip and strike problems connected with true and apparent dips, true and vertical thickness and width of the outcrop by calculation and geometrical methods.

Completion of outcrops : Determination of thickness of beds, identification of structural features in hand specimen, drawing of profiles and section showing the following features: Simple beds, folds, faults, unconformities, overlaps, offlaps and intrusion.

Books recommended.

- ❖ Woods, H. : Palaeontology invertebrate.
- ❖ Lehmann, U., Hillmer, G. 1983; Fossil Invertebrates, Cambridge University Press.
- ❖ Nield, E.W. and Tucer V.C.T., 1985; Palaeontology-An Introduction, Pergamon Press.

Paper-II : Petrology

Note : The paper will contain nine questions in each section. Candidates are required to attempt five questions in all selecting at least one question from each section.

Section-A

Nature and composition of magmas, plutonic, hypabyssal and volcanic rocks, intrusive and extrusive forms, structure and texture. Elements of classification of igneous rocks.

Crystallization of basaltic magma, Bowen's Reaction Principle, differentiation and assimilation.

Crystallisation of unicomponent and bicomponent silicate melts. Diopside-Albite-Anorthite basalt system and variation of igneous rocks. Study of common igneous rocks-Granite, rhyolite, gabbro, basalt, Pegmatite, dolerite, syenite, diorite and peridotite.

Section-B

Process of formation of sedimentary rocks-Weathering, decomposition, disintegration, transportation and deposition. Concept of lithification and diagenesis.

Sedimentary rocks-Structure, texture, residual, mechanically transported, chemical and organic deposits. Elementary idea of sedimentary environments and provenance.

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Study of common sedimentary rocks-sandstone, limestone, shale, conglomerate and greywacke.

Section-C

Metamorphism agents and types, Concept of grade and facies of metamorphism, Texture, structure and classification of metamorphic rocks.

Types of metamorphism and their products, Cataclastic, thermal and regional metamorphism. Dynamothermal metamorphism of argillaceous and calcareous rocks.

Retrograde metamorphism and metasomatism; anatexis. Study of important metamorphic rock, slate, schist, gneiss, granulite, marble.

Practical

Petrology - Neat drawing of different forms assumed by intrusive igneous rocks. Study and recording of the typical textures of plutonic, hypabyssal and volcanic rocks.

Megascopic study of the following igneous rocks: Granite, pegmatite, aplite, syenite, nepesine-syenite, diorite, gabbro, norite, dunite, peridotite, basalts, obsidian, lamprophyre, phonolite and trachyte.

Microscopic study of the following rocks; Granite, syenite, diorite, gabbro, dunite, pyroxenite, dolerite, rhyolite and basalt.

Sedimentary and Metamorphic rocks - Study of typical textures of sedimentary and metamorphic rocks. Systematic megascopic and microscopic study of the following rocks types: Conglomerate, breccia, sandstone, arkose, greywacke, shale, limestone, slate, phyllite, schist, gneiss, marble, quartzite, migmatite and charnockite.

Book Recommended

1. Tyrrel., G.W. : The principles of Petrology, Methuen & Co. London.
2. Harker, A. : Petrology, McGraw Hill Book Co. Inc. New York.
3. William, Turner & Gilbert, Petrography CBS Publisher, Delhi.
4. Jackson, J. Text Book of Lithology.
5. Hatch & Wales, Petrology.
6. Smith, H.O. : Minerals & Microscope.
7. Kerr : Optical Mineralogy, CBS Publisher, Delhi.