

B.SC IST YEAR GEOLOGY - 2010-11

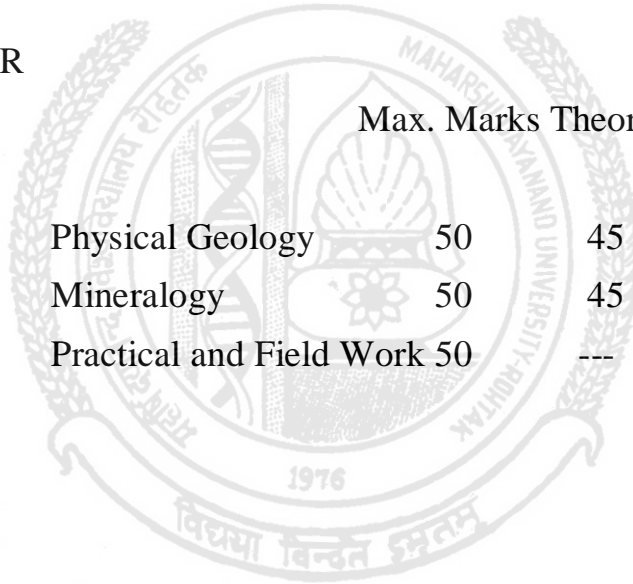
Scheme of examination, Maximum marks assigned to the paper and
Internal assessment

Ist SEMESTER

		Max. Marks Theory		I.A. Periods/ Week	
Paper-101	General Geology	50	45	05	3
Paper-102	Crystallography	50	45	05	3
Paper-103	Practical and Field Work	50	---	---	3

IIInd SEMESTER

		Max. Marks Theory		I.A. Periods/ Week	
Paper-201	Physical Geology	50	45	05	3
Paper-202	Mineralogy	50	45	05	3
Paper-203	Practical and Field Work	50	---	---	3



Syllabus

B.SC. IST YEAR - GEOLOGY

Ist-Semester

Paper - 101 - General Geology THEORY

Max. Marks : 50

Periods/Week: 3

Time : 3 hrs.

Note:- In all eight questions will be set by the examiner, selecting two questions from each unit. The student will attempt any five questions, selecting at least one question from each unit.

UNIT - I

Geology and its perspective. Earth in relation to solar system, origin, size, shape, mass, density and its development. Internal constitution of the Earth.

UNIT - II

Rock weathering and its type, factors influencing weathering, atmospheric circulation and its impact on weathering. Formation of hydrosphere, atmosphere and biosphere. Elementary ideas of continental drift and plate tectonics.

UNIT - III

Elementary ideas about outcrops, dip, strike, outlier, inlier and overlap.

Folds : Parts of fold, classification and description of fold types causes of folding.

UNIT - IV

Faults : Fault terminology, classification of faults, Recognition of faults, causes of faulting.

Unconformity : Formation of an unconformity, types of unconformities, detection of unconformities in the field.

References

1. Dutta A.K., Physical Geology
2. Thornbury W.D., Principles of Geomorphology, John Wiley.

B.SC. IST YEAR - GEOLOGY**Ist-Semester****Paper - 102 - Crystallography****THEORY****Max. Marks : 50****Perods / week: 3****Time : 3 hrs.**

Note:- In all eight questions will be set by the examiner, selecting two questions from each unit. The student will attempt any five questions, selecting at least one question from each unit.

UNIT - I

Elementary ideas about crystal structures, crystal faces, edges, solid angle and zones, type of forms. Interfacial angle and its measurement; Law of constancy of interfacial angles. Normal class of the cubic system

UNIT - II

Paramameter system of weiss. Index system of miller. Normal class of Tetragonal and Monoclinic systems.

UNIT - III

Study of Normal classes of (a) Hexagonal system (b) Triclinic system.

UNIT - IV

Twinning and its types. Normal class of orthorhombic system.

References

1. Read H.H., Rutley's Elements of Minerology
2. Dana E.S. and Ford W.D., A text book of Minerology

B.SC. IST YEAR - GEOLOGY

IInd-Semester

Paper-201 Physical Geology

THEORY

Max. Marks : 50

Periods/ Week: 3

Time : 3 hrs.

Note:- In all eight questions will be set by the examiner, selecting two questions from each unit. The student will attempt any five questions, selecting at least one question from each unit.

UNIT - I

Soil formation, soil profile and soil types. Geological work of a river : Erosion, transportation and deposition. Erosional and depositional features produced by the river.

UNIT - II

Wind : Erosion and its type; transportation and deposition by wind. Study of important erosional and depositional features of wind.

Lake : Definition, formation and geological work of lakes; importance of lake and important examples of Indian lakes.

UNIT - III

Glacier : Geological work of glaciers; glacial erosion, transportation & deposition. Features of erosion and deposition by glaciers.

Oceans : Geological work of oceans; wave erosion and depositional features of ocean.

UNIT - IV

Volcanoes : Types; origin and distribution

Mountains : Types and origin; Indian mountain systems.

References

1. Dutta A.K., Physical Geology
2. Thornbury W.D., Principles of Geomorphology

B.S.C. IST YEAR - GEOLOGY

IIInd-Semester

Paper-202 Mineralogy

THEORY

Max. Marks : 50

Perods/ week: 3

Time : 3 hrs.

Note:- In all eight questions will be set by the examiner, selecting two questions from each unit. The student will attempt any five questions, selecting at least one question from each unit.

UNIT - I

Minerals : Definition and classification, physical properties and chemical composition, classification of silicate structures with suitable examples. Elementary ideas about atomic minerals. Polymorphism, Isomorphism and pseudomorphism.

UNIT - II

Study of physical properties, chemical composition, systematic classification and mode of occurrence of the following :-

- | | |
|---------------------------------------|---------------------|
| (i) Silica group (rock forming group) | (ii) Pyroxene group |
| (iii) Mica group | |

UNIT - III

Study of physical, chemical properties, systematic classification and mode of occurrence of the following rock forming groups.

- | | |
|---|----------------------|
| (i) Feldspar group (rock forming group) | (ii) Amphibole group |
| (iii) Garnet group | |

UNIT - IV

Study of mineralogy of the following groups of ore minerals with special emphasis on their physical properties, chemical composition & occurrence:-

- | | |
|-----------------------|----------------------|
| (i) Iron group | (ii) Copper group |
| (iii) Aluminium group | (iv) Manganese group |

References

1. Read H.H., Rutley's Elements of Mineralogy
2. Dana E.S. and Ford W.D., A text book of Mineralogy

PRACTICALS AND FIELD WORK

Max. Marks : 50

Periods/ Week: 3

Time : 3 hrs.

Practical Paper - 103

Study of important geomorphological models and their interpretation.

Use of Clinometer and Brunton Compass.

Drawing of clinographic projection of important crystal models from various classes.

Geological Field Work.

PRACTICALS AND FIELD WORK

Max. Marks : 50

Periods/Week: 3

Time : 3 hrs.

Practical Paper - 203

Study of Elements of symmetry of at least one representative crystal form.

Normal classes of all crystal systems.

Study of physical properties of important rock forming minerals in hand specimen.

Geological Field Work.

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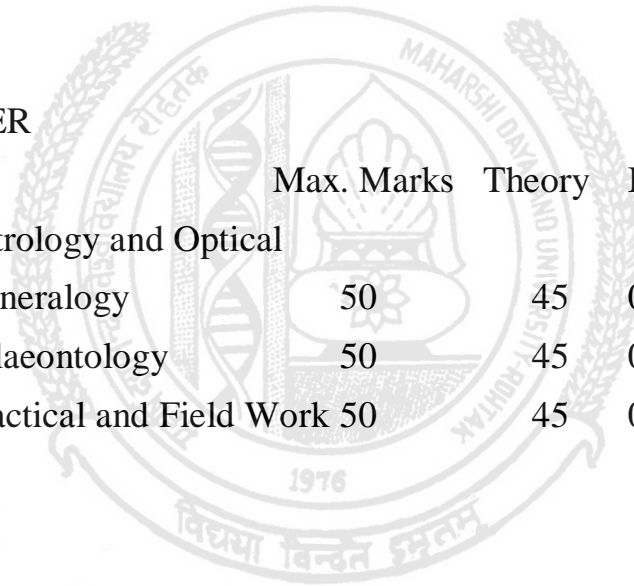
Scheme of examination, Maximum marks assigned to the paper and
Internal assessment

IIIrd SEMESTER

	Max. Marks	Theory	I.A.	Periods/Week
Paper-301 Petrology and Optical Mineralogy	50	45	05	3
Paper-302 Palaeontology	50	45	05	3
Paper-303 Practical and Field Work	50	---	---	3

IVth SEMESTER

	Max. Marks	Theory	I.A.	Periods/Week
Paper-401 Petrology and Optical Mineralogy	50	45	05	3
Paper-402 Palaeontology	50	45	05	3
Paper-403 Practical and Field Work	50	45	05	3



B.SC. IIND YEAR - GEOLOGY

IIIrd-Semester

Paper-301 - Petrology and Optical Mineralogy

THEORY

Max. Marks : 50

Periods/Week: 3

Time : 3 hrs.

Note:- In all eight questions will be set by the examiner, selecting two questions from each unit. The student will attempt any five questions, selecting at least one question from each unit.

UNIT - I

Rock association in time and space. Concept of Rock series.

Magma : Definition, composition, origin and process of crystallisation.

Crystallisation of unicomponent magma, Bowen reaction series.

UNIT - II

Crystallisation of bi-component magma. Magmatic differentiation and assimilation. Formation of rocks: Igneous, sedimentary and metamorphic. Differentiation between Igneous, sedimentary & metamorphic rocks.

UNIT - III

Igneous Petrology : Formation of Igneous rocks and their types.

Composition. Forms of Igneous rocks : concordant and discordant bodies.

Classification of Igneous rocks : chemical, mineralogical and tabular.

UNIT - IV

Igneous structures : Definition, origin and important types of structures of Igneous rocks.

Textures : Definition, origin and important types of textures of Igneous rocks.

Descriptive megascopic study of important Igneous rocks.

References

1. Tyrrel G.W., Principles of Petrology
2. Turner F.J., Metamorphic Petrology, McGraw Hill, New York, 1980.
3. Winchall A.N., Elements of Optical Mineralogy.

B.SC. IIND YEAR - GEOLOGY

IIIrd-Semester

Paper-302-Palaeontology

THEORY

Max. Marks : 50

Periods/Week: 3

Time : 3 hrs.

Note:- In all eight questions will be set by the examiner, selecting two questions from each unit. The student will attempt any five questions, selecting at least one question from each unit.

UNIT - I

Palaeontology : Definition & scope. Application of palaeontology in palaeoecology, evolution, stratigraphy and palaeogeographic reconstruction. Standard geological time scale : Era, periods, age and their major geological events.

UNIT - II

Trilobite : Introduction, morphological characters of a Trilobite shell.

Geological history of trilobite.

Important fossils of trilobite with their morphological characters, age and distribution.

Echinoidermeta : Introduction, morphological characters and geological history of echinoids.

UNIT - III

Morphological characters and geological history of gastropods.

Important fossils : their morphological characters and age - Physa, Natica, Trochus, Turritella, Cerithium, Murex, Voluta, Cypraea.

UNIT - IV

Lamellibranchia : (Pelecypods) Morphological characters and geological history of pelecypods.

Dentition in lamellibrachia.

Study of plant fossils of Lower Gondwana.

Fossils of pelecypoda : Pecten, Nucula, Area gryphaea, Trigonia, Cardita, Unio.

References

1. Woods H., Plaeontology.
2. Moore, Lalicker and Fisher, Invertebrate Fossils.

B.SC. IIND YEAR - GEOLOGY**IVth-Semester****Paper-401-Petrology and Optical Mineralogy****THEORY****Max. Marks : 50****Periods/Week: 3****Time : 3 hrs.**

Note:- In all eight questions will be set by the examiner, selecting two questions from each unit. The student will attempt any five questions, selecting at least one question from each unit.

UNIT - I

Sedimentary rocks : Formation, composition, textures and structures of sedimentary rocks. Classification of sedimentary rocks.

UNIT - II

Metamorphic rocks : Metamorphism, definition, factors affecting metamorphism. Types of metamorphism. Metasomatism. Metamorphic grades and zones.

Stress and antistress minerals.

UNIT - III

Textures, structures and classification of metamorphic rocks.
Descriptive study of important sedimentary and metamorphic rocks.

UNIT - IV

Petrological microscope : Its parts and functioning.

Optical Mineralogy : Colour & pleochroism, Refractive Index, cleavage, shape, alteration (if any), Isotropic Antisotropic Interference colour, Birefringence, Extinction and Twinning.

Optical properties of common rock forming minerals.

References

1. Tyrrel G.W., Principles of Petrology.
2. Turner F.J., Metamorphic Petrology, McGraw Hill, New York, 1980.
3. Winchel A.N., Elements of Optical Mineralogy.

B.SC. IIND YEAR - GEOLOGY**IVth-Semester****Paper-402-Palaeontology****THEORY****Max. Marks : 50****Periods/Week: 3****Time : 3 hrs.**

Note:- In all eight questions will be set by the examiner, selecting two questions from each unit. The student will attempt any five questions, selecting at least one question from each unit.

UNIT - I

Palaeontology : Fossils, essential conditions of fossilisation. Modes of preservation of fossils. Index Fossils. Economic and stratigraphic significance of fossils. Standard geological time scale.

UNIT - II

Morphology, geological history of a brachiopods shell. Brachial skeleton. Morphology and geological history of corals (Anthoorea)

UNIT - III

Morphological characters and geological history of cephalopods. Suture line in cephalopods.

Morphology and geological history of Graptolite.

UNIT - IV

Morphological characters, age and distribution of plant fossils of upper Gondwana.

Morphology and geological history of foraminifera.

References

1. Wood's H., Palaeontology.
2. Moore, Lalicker and Fisher, Invertebrate Fossils.

PRACTICALS AND FIELD WORK

Max. Marks : 50

Periods/Week: 3

Time : 3 hrs.

Practical Paper - 303

Study of important primary sedimentary structures in hand specimens.

Study of common Igneous, sedimentary & metamorphic rocks in hand specimen and their identification.

Microscopic study of common rock forming minerals with the help of their diagnostic optical properties.



PRACTICALS AND FIELD WORK

Max. Marks : 50

Periods/Week: 3

Time : 3 hrs.

Practical Paper - 403

Study of morphological characters and identification of important fossils phyla as mentioned in theory papers.

Study of important plant fossils of lower & upper gondwan and their identification.

Study of common Igneous, sedimentary and metamorphic rocks in hand specimen and their identification.