

Syllabus and Course Scheme
Academic year 2022-23



Bachelor of Science- Geology

Exam.- 2023

UNIVERSITY OF KOTA

**MBS Marg, Swami Vivekanand Nagar,
Kota - 324 005, Rajasthan, India**

Website: uok.ac.in

University of Kota, Kota

B.Sc.- Pt-II (Geology) Exam

The examination shall consist of three theory papers and one practical.

	Hrs/Week	Exam/Hrs.	Marks
A. Theory Papers			
Paper I : Structural Geology	2	3	50
Paper II : Petrology	2	3	50
Paper III : Stratigraphy	2	3	50
B. Practical	4	4	75
Total Marks			225

Note:

Time: 3 hrs

MM 50

Note: Each paper will be divided into THREE parts.

Part- I

Ten questions (short types answer) two from each Unit will be asked. Each question will be of one mark and the candidates are required to attempt **ALL** question. **Total-10 marks.**

Part –II

Five Questions (answer not exceeding 250 word) one from each Unit with internal choice will be asked and the candidates are required to attempt **ALL** questions. Each question will be of 05 marks. Total 25 marks.

Part –III

Four questions may be in part covering all five Units (answer not exceeding 500 words) will be asked. The candidates are required to attempt any **TWO** question. Each question will be of 7^{1/2} marks. Total 15 marks.

Paper-I: STRUCTURAL GEOLOGY

Time: 3 hrs

MM 50

UNIT-I

Basic concept of structural geology. Concept of strike and dip. Effects of topography on outcrops. Description and applications of clinometers compass. Primary sedimentary structures, their use in determination of top and bottom of beds.

UNIT-II

Folds: Characteristics and their types; Elementary ideas of mechanism of folding; outcrop pattern of non-plunging, plunging and doubly plunging folds.

UNIT-III

Faults: Characteristics and classification, effects of faults on outcrop, criteria of their recognition in field.

UNIT-IV

Mechanical principles: Stress and strain. Geological examples of strain in rocks. Types of unconformity; their recognition, significance and distinction from faults. Outliers, inliers, overlap and offlap.

UNIT-V

Preliminary ideas of foliation, Lineation, and joints. Rock Structures like rapakivi, flow Structures, argen gneiss.

Paper-II: PETROLOGY

Time: 3 hrs

MM 50

UNIT-I

Introduction to Petrology. Igneous rocks: Forms, structures, textures and microstructures. Composition of magma, Classification of igneous rocks.

UNIT-II

Processes of differentiation, gaseous transfer liquid immiscibility and assimilation. Description of the following rock forming families : granite – granodiorite, syentie-diorite- gabbro, feldspathoidal – syenite, ultrabasic and ultramafic and ultramafic rocks.

UNIT-III

Metamorphic rocks: Definition, control of metamorphism. Metamorphic processes and reaction. Types of metamorphism – contact, catalastic, regional and Burial metamorphism.

UNIT-IV

Texture and structure of metamorphic rocks. Nomenclature and description of important metamorphic rocks. Metasomatism, anatexis and migmatiation. Sedimentary rocks: Processes of formation of sediments, digenesis. Textures of sedimentary rocks.

UNIT-V

Major sedimentary structures – primary, secondary, biogenetic and their significance. Classification of sedimentary rocks. Types of arenites, carbonate rocks and argillites.

Paper-III: STRATIGRAPHY

Time: 3 hrs

MM 50

UNIT-I

Principal of stratigraphy. Stratigraphic classification. Stratigraphic correlation. Problems of early Precambrian stratigraphy. Brief idea about the process of early crustal evolution. Major Precambrian Provinces of India. Physical division of India their characteristics.

UNIT-II

Geological Time Scale and its equivalent formation in India. Precambrian Stratigraphy of Rajasthan, Dharwar region, Singhbhum region, Nagpur-Bhandara region.

UNIT-III

Distribution, lithology Classification and economic importance of Avavalli super group, Cuddapah, Supergroup, Delhi Supergroup and Vindhyan Supergroup. Precambrian belts of Extra-Peninsular region.

UNIT-IV

Geology of Gondwana Supergroup and Palaeozoic stratigraphy of India, their distribution, division, lithology, fossil content and economic importance.

UNIT-V

Mesozoic and Cenozoic geology of India, their distribution, division, lithology and fossil content. Mesozoic stratigraphy of Rajasthan.

B.Sc. (Part-II) Geology Practical 2022-2023

The Examination will be of four hours' duration.

Maximum Marks 75

Petrology

- | | |
|-------------------------------------|----|
| 1. Study of rocks in hand specimens | 08 |
| 2. Microscopic study of rocks | 07 |

Structural Geology

- | | |
|---|----|
| 3. Interpretation and drawing of section of simple geological map | 10 |
| 4. Problem of true and apparent dips | 05 |

Stratigraphy

- | | |
|--|----|
| 5. Stratigraphic rocks in hand specimen. | 10 |
| 6. Sketch map of India geological formation and paleogeographic period | 05 |
| 7. Field report | 10 |
| 8. Viva-Voce | 10 |
| 9. Record | 10 |

Total	<hr/> 75 <hr/>
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STRUCTURAL GEOLOGY:

1. Study of topographic maps. Interpretation of topography from contour maps.
2. Orientation of planes and lines; dip, strike, pitch and plunge. Use of clinometers compass.
3. Study and interpretation of outcrop patterns. True and apparent thickness of beds, study of simple of geological maps and drawing of sections.
4. Basic principles of stereographic and orthographic projections.

PETROLOGY:

(1) Identification of igneous, metamorphic and sedimentary rocks in hands specimens as per list given below:

Igneous Rocks:

Granite, granodiorite, syenite, diorite, gabbro, pyroxenite, peridotite, nepheline syenite, pegmatite, dolerite, basalt and rhyolite.

Metamorphic Rocks:

Quartzite, marble, gneiss, mica schist, phyllite, slate, amphibolite, charnockite, mylonite and migmatite.

Sedimentary Rocks:

Sandstone, limestone, shale, conglomerate, arkose, grit, greywacke, and breccias.

(2) Petrographic study of the following rocks under microscope: granite, gabbro, dolerite, basalt, mica schist, gneiss, amphibolite, marble, sandstone, limestone and quartzite.

STRATIGRAPHY:

Identification and description of important stratigraphic rock of India and their assignment to respective stratigraphic position. Plotting of following stratigraphic units and their equivalents in the outline map of India. Delhi and Aravali Supergroups, Main Vindhyan Basin, Gondwana Supergroup, Deccan traps and Siwalik Group. Preparation of palaeogeographic maps of Permocarboniferous and Cretaceous periods.

FIELD WORK:

Field work for 3 day for training in geological mapping of rock units and measurement of Structural features and report thereon.

Books suggested, besides the Internet: B.Sc. Part-II

Billings M.P. : Structural Geology, Prentice Hall of India Pvt. Ltd., New Delhi.

Bolton T.: Geology Maps their solution and interpretation, Cambridge University Press

Haung G.N. : Petrology

Krishna M.S.: Geology of India and Burma, CBS Publishing & Distributors, Delhi

Lemon R.R.: Principles of Stratigraphy, Merrill Publishing Company, London

Mukerjee P.K.: A Textbook of Geology, The word Press Pvt. Ltd., Calcutta.

Naqvi S.M. & Rogers J.J.W.: Precambria Geology of India. Oxford University Press.

Parbin Singh: Engineering & General Geology, S.K. Kataria & Sons, New Delhi.

Pettjohn F.J.: Sedimentary Rocks, CBS Publishers & Distributors, Delhi.

Ravindra Kumar: Fundamentals of Historical Geology and Stratigraphy of India, Wiley Eastern Ltd., New Delhi.

Sinha Roy, S., Malhotra, G., & Mohanty, M., 1998: Geology of Rajasthan, Geological Society of India, Bangalore, pp278.

Tyrrell G.W.: The principles of Petrology, B.I. Publications Pvt., Ltd., Delhi.

Weller J.M.: Stratigraphic Principles and Practice, University Books Stall, Delhi.

K.M. Bangar : Principles of Engineering Geology Standard Publisher & Distributor.

A.B. Roy : Fundamentals of Geology Alfa Science International.