Department of Geology

JAI NARAIN VYAS UNIVERSITY, JODHPUR

FACULTY OF SCIENCE

NEW CAMPUS

B. Sc. II year Geology 2023-2024

Theory			
Paper I		Igneous and Metamorphic Petrology	50 Marks
Paper I I		Sedimentary Petrology	50 Marks
Paper I II		Stratigraphy	50 Marks
Practical	:	Practical Examination	75 Marks
		Total	225 Marks
Duration of each theory paper Examination			3 Hrs.
Duration of Practical Examination			3 Hrs.

PAPER I : IGNEOUS AND METAMORPHIC PETROLOGY

Unit I:

Composition of magma. Crystallization of Unicomponent (Silica), Bicomponent (Ab-An) and Tricomponent magma(Ab-An-Di). Bowen's Reaction Series. Forms and Structures of Igneous rocks

Unit II:

Textures and their genetic implications for Igneous rocks. Elementary idea of classification of Igneous rocks based on Mineralogical, Mode of occurrence and Geochemical factors. Tabular classification of Igneous rocks.

Unit III:

Metamorphism and its kinds and agents. Concept of depth zones, facies and grades of metamorphism. Texture and structures of metamorphic rocks.

Unit VI:

Regional metamorphism of argillaceous, arenaceous and mafic rocks.Thermal metamorphism of carbonate rocks.Cataclastic metamorphism.

Unit V:

Megascopic and microscopic characteristics and petrogenesis of following rocks. (A) Granite, Syenite, Gabbro, Anorthosite, Peridotite, Pegmatite, Lamprophyre, Rhyolite, Basalt. (B) Quartzite, Marble, Phyllite, Schist, Slate, Gneiss, Migmatite, Granulite and Charnokite.

PAPER II:SEDIMENTARY PETROLOGY

Unit I:

Sediments and Sedimentary rocks, the process of their formation;

Sedimentary structure: Surface structure- ripple marks, sole marks, rill marks, rain prints. Internal structure: bedding, gradded bedding, cross bedding and penecontemporaneous deformation. Biogenic structures:stromatolites and ichnofossils.

Unit II:

Texture of sedimentary rocks; grain size their distribution and geological significance, shape sphericity and roundness, packing orientation and internal fabric of sedimentary rock.

Heavy minerals: The process of separation and study for provenance determination.

Unit III:

Types of sediments and sedimentary rocks- clastic rocks, their classification and characteristics,Petrogenesis of common clastic rocks.Characteristics of Sandstone, Siltstone, Shale, Conglomerate and Breccia.

Unit IV:

Chemical and Biogenic Rocks : Characteristics, classification and origin. Characteristics of Limestone, Dolomite, Phosphorite, Lignite and Coal.

Unit V:

Elementary knowledge of sedimentary environments. Characteristics of their products: Glacial, Lacustrine, Fluvial, Deltaic Shore line, Shelf and deep marine environments.

PAPER III: STRATIGRAPHY

Unit I:

Geological Time Scale: various boundaries and characteristics of each division and Indian equivalents. Time -unit, Rock -unit and Time –Rock -unit, Principles of Stratigraphy Stratigraphic correlation and various methods of its determination.

Unit II:

Archean Geology of Dharwar Craton, Singhbhum Craton, Baster Craton and Eastern Ghat Craton and Rajasthan Craton (Bhilwara Supergroup to include BGC and Pre-Aravalli-metasediments).

Unit III:

Proterozoic: Aravalli Supergroup, Cuddapah Supergroup, Delhi Supergroup, Vindhyan Supergroup and Malani Igneous Suite. Permian -Triassic boundary.

Unit IV:

Palaeozoics and Mesozoics of Salt Range, Spiti, Kashmir and Kumaun Himalaya. Marwar Supergroup and Mesozoics of Rajasthan. Jurassic of Kutch, Cretaceous of Trichinopoly. Gondwana Supergroup and Deccan Traps. Cretaceous -Tertiary boundary.

Unit V

Tertiary Rocks of North-eastern India, Western Rajasthan and Kachchh. Siwalik Supergroup. Quaternary Geology: Indogangetic plains, Thar Desert. Unheavels and lost of river Saraswati.

PRACTICAL

1. Petrological characteristics (Mineralogy, texture and structural and Petrogenesis) of important Igneous, Metamorphic and Sedimentary rocks in hand specimens.
2. Petrological characterstics (Mineralogy, texture and structural and Petrogenesis) of important Igneous, Metamorphic and Sedimentary rocks under Petrological Microscope.
3. Identification and Stratigraphic Ordering of rock samples.
4. Demarcation of important Supergroups of Indian Stratigraphy in outline map of India.
5. Preparation of Geological map of western Rajasthan in Lab.
6. Sessional Marks.

SUGGESTED READING

1. Tyrrell GW: Principles of Petrology
2. Tyrell GW: Shailiki Ke Sidhant, Madhya Pradesh Hindi Granth Academy, Bhopal.

3. Pettijohn: Sedimentary Rocks, C. B. S. Publication, New Delhi

4. Best, M. G.: Igneous and Metamorphic Petrology C. B. S. Publication, New Delhi.

5. Krishnan M S :Geology of India and Burma, C. B. S. Publication, New Delhi.

6. Ravindra Kumar: Fundamentals of Historical Geology and Stratigraphy of India. Willey Eastern New Delhi

7. Wadia D. N.: Geology of India

8. Bharatvarsh Ka Bhu Vigyan : Madhya Pradesh Hindi Granth Academy, Bhopal.

9. Roy A. B. and Jakhar S.R. : Geology of Rajasthan (Northwest India) Precambrian to Recent. Scientific Publishers (India), Jodhpur.