Paper: GELH201 (THEORY): Petrology *(Contact Hours: 72)*

Max.Marks: 75 *Time: 3 hours*

Group A: (Igneous Petrology)

Unit I: Introduction:
Igneous rocks and magma. Mode of occurrence of igneous rocks-volcanic, hypabyssal and plutonic rocks; forms of igneous rocks – extrusive (vesicular structure, pillow structure, flow banding, ropy lava, blocky lava, columnar jointing) and intrusive rocks. Bowen's Reaction Series. Magmatic differentiation and Assimilation. IUGS classification for plutonic volcanic rocks.

Unit II: Texture and Petrography:
Textures and micro- structures of igneous rocks.
Petrography of the following rocks - granite, granodiorite, pegmatite, rhyolite, diorite, trachyte, gabbro, dolerite, basalt, norite, syenite, peridotite, dunite.

Group B: (Sedimentary and Metamorphic Petrology)

Unit III: Sedimentary Petrology:

Introduction to sedimentology and process of sedimentation- breakdown of rocks. Diagenesis. Genetic classification of sedimentary rocks.
Texture of sedimentary rocks; clastic and non - clastic textures.
Structures of sedimentary rocks: Mechanical, penecontemporaneous, chemical and organic structures.
Siliciclastic rocks: Conglomerate and breccia, composition, classification;
Sandstone:Composition, maturity and Dott's classification;
Shale: Types and composition.
Carbonates: Limestone- components, classification as proposed by Folk and Dunham.

Unit IV: Metamorphic petrology:
Concept of metamorphism; factors and types of metamorphism. Concepts of grades of metamorphism with the help of Barrovian index minerals and basic divisions of metamorphic grade (metamorphic facies).
Textures, structures and naming of metamorphic rocks- granoblastic, porphyroblastic, poikiloblastic, cataclastic, maculose, schistose, granulose and gneissose.
Petrography of common metamorphic rocks: Slate, phyllite, schist, quartzite, marble, amphibolite and gneiss.
Distribution, association and brief petrography of charnockite, khondalite, gondite and granulite.

Reading List

1. Best, M.G.(1986) *Igneous and Metamorphic Petrology*, CBS
2. Carmichael, I., Turner, F. and Verhoogen, J.(1977) *Igneous Petrology*, McGraw Hill
3. Collinson, J.D. and Thompson, D.B(1989). *Sedimentary Structures*, Unwin Hyman
4. Ehlers, E.G. andBlatt, H.(1987) *Petrology*, CBS Publication New Delhi
5. Hall, A(1987) *Igneous Petrology*, ELBS
6. Hatch, F. Wells, A.K. and Wells, M.K.(1984) *Petrology of Igneous Rocks*, CBS
7. Mason, R.(1978) *Petrology of Metamorphic Rocks*, CBS
8. Pettijohn, F.J.(1984)*Sedimentary Rocks*, CBS
9. Sengupta, S.(1994) *Introduction to Sedimentology*, Oxford and IBH
10. Tucker, M.(1981) *Sedimentary Petrology*, ELBS
11. Turner, F. and Verhoogen, J.(1977)*Igneous and Metamorphic Petrology*, CBS
12. Tyrell, G.H.(1976)*Principles of Petrology*, Asia Publishing House
13. Winkler, H.G.F.(1976) *Petrogenesis of Metamorphic Rocks*, Springer Verlag
14. Yardley, B.(1989) *An Introduction to Metamorphic Petrology*, ELBS
15. Raymond L.A.(2002) *The study of Igneous, Sedimentary and Metamorphic Rocks* McGraw Hill
16. Winter J.D. *An Introduction to Igneous and Metamorphic Petrology,* Prentice Hall

Paper: GELH202 (PRACTICAL). Petrology

(Contact hours: 48)

Max. Marks: 25

Time: 4hours

1. Petrology: **(Hand specimens)** *Marks: 1½ x 6 = 9*

Recognition of the following rocks in hand specimens-

Granite, pegmatite, gabbro, syenite, rhyolite, trachyte, diorite, dolerite, basalt, dunite, shale, limestone, sandstone, conglomerate, phyllite, slate, gneiss, quartzite, schist, gneiss, marble.

2. Petrology: (Thin sections) *Marks: 4 x 2 = 8*

Study of mineral constituents, texture and structure of the following rocks and their identification:
Granite, rhyolite, syenite, diorite, gabbro, dolerite, basalt, limestone, sandstone, gneiss and schist.

3. Geological Field Work (Local) *Marks: 4 (Field work 2+Field report 2)*

4. Laboratory notebook and viva- voce *Marks: 2+3=5*

Reading List:

1. Collinson, J.D. and Thompson, D.B.(1989) *Sedimentary Structures*, Unwin Hyman
2. Heinrich, E.(1976) *Microscopic Petrology*, McGraw Hill
3. Moorehouse, W.W.(1985)*A Study of Rocks in Thin Section*, CBS
4. Read, H.H.(1984) *Rutley's Elements of Minerology*, CBS
5. Sen, A.K(1995) *Laboratory Manual of Geology*, Modern Book agency, Calcutta
6. Williams H.,Turner, F and Gilbert,C.(1985) *Petrography*, CBS