GEOLOGY
Second Year PUC

Theory

Total hours: 120+40=160 **Total marks**: 70+30=100

Unit	Unit-wise weightage	Marks	Periods
I	Petrology	30	55
II	Structural Geology	15	25
III	Stratigraphy	10	15
IV	Palaeontology	15	25
V	Practical	30	40

Chapters

120 Hours

Unit	Sub-unit	**Petrology**	**Total: 05**
1.0	1.1	Introduction - Definition of a rock, general classification of rocks into igneous, sedimentary and metamorphic types. Rock cycle.	05
2.0		**Igneous rocks**	**Total: 25**
	2.1	i) Introduction a) Definition of magma and lava b) Composition of magma c) Forms of igneous rocks 1) Extrusive – Lava flows 2) Intrusive – Concordant (Sill) and Discordant (Dyke)	
	2.2	i) Structures – Definition ii) Types – Vesicular, Amygdaloidal, Columnar, Ropy and Pillow	03

	2.3	i) Texture – Definition ii) Controlling factors – Crystallanity: Holocrystalline, Merocrystalline and Holohyaline	
		iii) Granularity – Coarse, Medium and Fine iv) Shape of minerals – Euhedral, Subhedral and Anhedral v) Mutual relationship of minerals a) Equigranular: Panidiomorphic, Hypidoimorphic and Allotriomorphic b) Inequigranular: Porphyritic, Poikilitic and Ophitic	07
	2.4	Classification of igneous rocks: (i) Volcanic, (ii) Hypabyssal and (iii) Plutonic with examples	05
	2.5	i) Brief description of important igneous rocks a) Volcanic – Basalt and Pumice b) Hypabyssal – Dolerite and Porphyry c) Plutonic – Granite and Syenite	04
	2.6	Uses of igneous rocks	01
	2.7	Significance of igneous rocks	01
	2.8	Summary (Points to remember)	-
	2.9	Model questions	-
3.0		**Sedimentary rocks**	**Total: 10**
	3.1	i) Introduction. Definition ii) Processes and formation of sedimentary rocks: Weathering, Erosion, Denudation, Transportation, Deposition, Compaction. Lithification and Diagenisis	03
	3.2	i) Structures; Stratification, Lamination, Graded bedding, Current bedding, Ripple marks and Mud cracks	02
	3.3	i) Textures; Wentworth's grain size parameters. Boulder, Cobble, Pebble, Gravel, Sand, Silt and Clay.	02
	3.4	i) Classification of sedimentary rocks based on- a) Mode of origin – Residual, Mechanical, Chemical and Organic. b) Grain size – Rudaceous, Aranaceous and Argillaceous	03

	3.5	Brief description of sedimentary rocks viz. Conglomerate, Breccia, Sandstone, Shale, Limestone and Shell Limestone.	
	3.6	Summary (Points to remember)	-
	3.7	Model questions	-
4.0		**Metamorphic rocks**	**Total: 15**
	4.1	Introduction – Definition of metamorphism	01
	4.2	Agents of metamorphism – Temperature, pressure and chemically active fluids	02
	4.3	Zones of metamorphism – Epi-, Meso- and Hypo-zones	02
	4.4	Kinds of metamorphism in brief – Dynamic, Thermal, Dynamothermal and Plutonic	03
	4.5	Textures and structures viz. Granulose, Gneissose and Schistose.	03
	4.6	i) Description of important metamorphic rocks a) Slate b) Marble c) Quartzite d) Gneiss e) Schist f) Charnockite	04
	4.7	Summary (Points to remember)	-
	4.8	Model questions	-
5.0		**Structural geology**	**Total: 25**
	5.1 5.2	i) Introduction a) Attitude of beds – Strike and Dip b) Outcrops, Inliers and Outliers Brunton compass and its uses	05
	5.3	i) Conformity and Unconformity a) Types of Unconformity – Angular, Disconformity and Nonconformity	04

	5.4	i) Joints – Definition ii) Attitude of joints – Strike and Dip iii) Types of joints viz. Dip-, Strike-, Oblique-, Bedding-	
		and Columnar-joints	04
	5.5	i) Folds – Definition ii) Parts of a fold viz. Hinge, Axis, Axial-Plane, Limbs, Crest, Trough and Plunge iii) Types of fold viz. Anticline, Syncline, Symmetrical and Asymmetrical	06
	5.6	i) Faults – Definition ii) Parts of a fault viz. Fault plane, Fault line, Foot-wall and Hanging-wall iii) Types of fault–Normal, Reverse, Step, Horst and Graben iv) Importance of geological structures	06
	5.7	Summary (Points to remember)	--
	5.8	Model questions	--
6.0		**Stratigraphy**	**Total: 15**
	6.1	i) Definition ii) Principles of Stratigraphy a) Law of Order of Superposition b) Uniformitarianism c) Conformable and unconformable beds	06
	6.2	i) Geologic Time Scale ii) Salient features of; a) Precambrian – Archaean and Proterozoic b) Phanerozoic – Palaeozoic, Mesozoic and Cainozoic	06
	6.3	Geology of Karnataka – A brief outline	02
	6.4	Importance of stratigraphy	01
	6.5	Summary (Points to remember)	-
	6.6	Model questions	-
7.0		**Palaeontology**	**Total: 25**

	7.1 7.2	Introduction i) Conditions for preservation a) Possession of hard parts	11
	7.3	b) Immediate burial c) Suitable environment i) Types of fossilization a) Mummification b) Mould and Cast c) Carbonization d) Entire skeleton remaining unchanged e) Petrification f) Tracks, Trails and Footprints	
	7.4	i) General Morphology and range in age of following fossils; a) Corals - Calceola b) Brachiopods - Terebratula c) Gastropods - Fusus d) Trilobites – Paradoxides	08
	7.5	i) Plant fossils – Brief morphology and range in age of the following; a) Glossopteris b) Ptillophylum	05
	7.6	Significance and uses of fossils	01
	7.7	Summary (Points to remember)	-
	7.8	Model questions	-

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Practical

Total Practicals: 20

Duration of each practical: 2 hours

Total hours: 40 **Total Marks**: 30

Practical	Unit-wise weightage	Marks	Periods
A	Petrology	10	15
B	Structural Geology	07	13
C	Palaeontology	07	10
D	Field report + Lab record	06	02

A. PETROLOGY

Expt No. **Igneous rocks**

(1) Study of rocks in hand specimens
- a) Basalt
- b) Pumice
- c) Dolerite
- d) Granite
- e) Syenite

(2) Study of structures -
- a) Vesicular
- b) Amygdaloidal
- c) Columnar and
- d) Pillow Structure

Sedimentary rocks

(3) Study of rocks in hand specimens
- a) Conglomerates

b) Breccia
c) Sandstone
d) Limestone
e) Shell limestone

(4) Study of Primary structures

a) Stratification
b) Cross bedding
c) Ripple marks
d) Mud cracks

Metamorphic rocks

(5) Study of structures

a) Granulose
b) Gneissose
c) Schistose

(6) Study of rocks in hand specimens

a) Marble
b) Quartzite
c) Gneiss
d) Schist
e) Charnockite

B. Structural geology

(7) Study of Brunton Compass
(8) Measurements of Dip and Strike of rock strata by using Brunton Compass.
(9) Study of contour maps with geological cross section
(10) Study of horizontal series of beds with geological cross section
(11) Study of Inclined series of beds with geological cross section
(12) Problems on Dip
(13) Problems on Strike

C. Palaeontology

Sketch, label and identify the following animal and plant fossils with their range in age-

(14) Calceola
(15) Terebratula
(16) Fusus
(17) Paradoxide
(18) Glossopteris
(19) Ptylophyllum
(20) Geological field work

D. Preparation of geological field report and laboratory records