CURRICULUM AND SYLLABUS for Classes XI & XII

338

GEOLOGY

CLASS-XI THEORY

One Paper

3 Hours

70 Marks

337

Unit	Unitwise Weightage	Marks	Periods
I.	General Geology and Physical Geology	15	40
II.	Crystallography and Mineralogy	20	50
III.	Palaeontology	20	50
IV.	Economic Geology	15	40

UnitI: General Geology and Physical Geology

40 Periods: 15 Marks

- Introduction of Geology, definition, scope of Geology and branches of Geology.
- (ii) The Earth as Planet, shape, of the Planet.
- (iii) Origin of the Earth–Nabular hypothesis. Planetesimal hypothesis. Double star hypothesis and Recent hypothesis.
- (iv) Age of the earth–Concept of determination of the age of the earth by Radioactive method.
- (v) Internal constitution and structure of the earth as revealed by Seismic waves.
- (vi) Earthquake-definition, causes, effects and types.
- (vii) Volcanoes-definition, causes, structure and products.
- (viii) Concept of Plate tectonics.
- (ix) Definition, agents and processes of weathering, erosion, denudation and deposition.

Unit II: Crystallography and Mineralogy:

- 50 Periods: 20 Marks
- Crystal-definition, form, face, edge, solid angle, interfacial angle and its measurements, Symmetry elements, intercepts and parameters, indices and axial ratio.
- (ii) Crystal systems-Classification of seven crystal systems,
 -Study of the Normal Classes of Isometric system, Tetragonal system,
 Hexagonal system with examples.
- (iii) Mineral definition, types of minerals (amorphous, Crystalline, rock forming minerals, ore forming minerals)
- (iv) Physical properties of minerals-form, Colour, streak, lustre, cleavage, fracture, hardness, tenacity, taste, feel, odour etc.

- (v) Nicol Prism and its construction, Part of Petrological microscope.
- (vi) Moh's scale of Hardness and its uses.
- (vii) Study of Physical properties, Chemical composition and uses of the following rock forming minerals-Quartz, Orthoclase, Microcline, Plagioclase, Calcite, Homblende, Olivine, Tourmaline, Muscovite, Biotite, Talc, Gypsum, Garner, Flourite, Apatite, Corundum.

Unit III: Palaeontology:

50 Periods: 20 Marks

- (i) Definition and branches of palaeontology
- (ii) Definition-fossil, index fossil, Megafossil, Macrofossils, Microfossils.
- (iii) Conditions for fossilisation, mode of preservation and uses of fossils
- (iv) Classification, Morphological study, time range and distribution of Lamellibranchia, Brachiopoda and Gastropoda.

Unit IV: Economic Geology

40 Periods: 15 Marks

- (i) Definition Ore, Gangue, tenor
- (ii) Classification of mineral deposits.
- (iii) Formation of mineral deposits-Magnatic and oxidation processes.
- (iv) Study of Origin, mode of occurrence, Geographical distribution and uses of the following ore minerals-Galena, Gold, Heamatite, Megnetite, Chromite, Chalcopyrite, Pyrite, Coal, Petroleum, Bauxite.
- (v) Mineral resources of Manipur.

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GEOLOGY

CLASS-XI PRACTICAL

One Paper 3 Hours 30 Marks

Unit	Unitwise Weightage	Marks
I.	Crystallography	06 marks
II.	Mineral Hand Specimens	08 marks
III.	Mineral Slides	04 marks
IV.	Fossils	06 marks
V.	Practical Note Book	04 marks
VI.	Viva-Voce	02 marks

Expe

perimen	ts:	
(i)	Study of crystal belonging to the Normal Classes of Isometric, Tetragonal, Hexagonal Systems	4 marks
(ii)	Measurements of Interfacial angles on crystal models with the help of contact Goniometer.	2 marks
(iii)	Determination of specific gravity of minerals with the help of Jolly's spring balance, walker's steelyard balance or Chemical balance.	2 marks
(iv)	Recognition of mineral hand speciments by physical characters and simple chemical tests of the following miners - Quartz, Orthoclase, Microcline, Plagioclase, Muscovite, Biotite, tourmaline, Calcite, Homblende, talc, Gypsum, Beryl, Olivine, Garnet, Chromite, Magnetite, Heamatite, Bauxite Pyrite, Galena, Chalcopyrite, Apatite, Corundum.	6 marks
(v)	Recognition of the following rock forming mineral thinslides under polarising microscope-Garnet, Quartz, Orthoclase, Microcline, Augite, Hornblende, Biotite, Muscovite and Plagioclase.	4 marks
(vi)	Study of the morphological characters, time range of the following fossils - Arca, Spirifer, Productus Terebratula, Atrypa, Unio, Pecten, Cardita, Conus Voluta, Turritella, Mytilus, Physa.	6 marks
(vii)	Practical Note Book.	4
(viii)	Viva-Voce.	2

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DESIGN QUESTION PAPER/UNIT TEST

Subject : GEOLOGY

Unit/Paper : Theory

Class: XI

Time: 3 Hours

Full Marks: 70

I	WEIGHTAGE TO OBJECTIVES:								
	Obje	ectives	K	U	U		A	S	Total
	Perc	centage of Marks	35	45			15	05	100
	Mar	ks	25	31			10	04	70
II.	WE	IGHTAGE TO FORM	OF QUEST	IONS :					
	Forr	ns of Questions	E	SA-I	SZ	\—II	VS	O <i>P</i>	Total
	No.	of Questions	03	07		10	10	04	34
	Mar	ks Allotted	15	21		20	10	04	70
	Esti	mated Time (in Minutes)	60	42		40	30	08	180
Ш.	WE	IGHTAGE TO CONTE	ENT:						
	Units/Sub-units								Marks
	1.	General Geology and Ph	ysical Geolo	gy					15
	2.	Crystallography and Mir	neralogy						20
	3.	Palaeonotology							20
	4.	Economic Geology							15
								Total:	70
IV.	SCH	HEME OF SECTION :	Nil						
V.	SCH	HEME OF OPTIONS:	Nil						
VI.	DIF	FICULTY LEVEL:							
		Diffici	lt : 15% m	narks					
		A verag	ре : 50% m	narks					
		Eas	sy : 35% m	narks					

Abbreviation: K (Knowledge),

U (Understanding), S (Skill),

A (Application), E (Essay Type), SA (Short Answer Type),

VSA (Very Short Answer Type), O (Objective Type)

DESIGN QUESTION PAPER/UNIT TEST

Subject: GEOLOGY Unit/Paper: Practical

Class: XI

Time: 3 Hours

Full Marks: 30

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I		IGHTAGE TO OBJECT							<u> </u>	
		ectives	K	U		A			S	Total
		centage of Marks	13	20			27		40	100
	Mar	ks	04	06			80		12	30
I.	WEIGHTAGE TO FORM OF QUESTIONS:									
	Forms of Questions E SA-I SA-II VSA O							Total		
	No.	of Questions	02	08		04	02		-	16
	Mar	ks Allotted	08	16	(04	02		-	30
	Esti	mated Time (in Minutes)	30	120	,	20	10		-	180
ш.	WE	IGHTAGE TO CONTE	ENT:				•			•
			Units/Suk	units						Marks
	1.	Study of Crystals								4
	2.	Measurement of interfac	ial angle (s)							2
	3.	Determination of Specifi	c Gravity							2
	4.	Recognition of Mineral l		ens						6
	5.	Microscopic study of M								4
	6.	Study of Fossils								6
	7.	Practical Note book								4
	8.	Viva Voce								2
								Tæ	al :	30
IV.	SCH	HEME OF SECTIONS :	Nil							
V.	SCH	HEME OF OPTIONS:	Nil							
VI.	DIF	FICULTY LEVEL:								
	Difficult : 15% marks									
		Averac	ре: 50% m	narks						
	Easy: 35% marks									
	Easy: 33% Marks									

Abbreviation: K (Knowledge),

U (Understanding),

A (Application),

S (Skill),

E (Essay Type),

SA (Short Answer Type),

VSA (Very Short Answer Type), O (Objective Type)

GEOLOGY

CURRICULUM AND SYLLABUS for Classes XI & XII

CLASS-XII THEORY

3 Hours

One Paper

70 Marks

Unit	Unitwise Weightage	Marks	Periods
I.	Structural Geology	15 marks	40 periods
II.	General Stratigraphy and Indian Stratigrapy	20 marks	50 periods
III.	Petrology	20 marks	50 periods
IV.	Applied Geology	15 marks	40 periods

UnitI: Structural Geology

40 Periods: 15 Marks

- Definition and scope of structural Geology.
- Study and measurement of the dip and strike of beds.
- Concept of contour.
- Definition, parts and types of fold.
- Definition, Parts, relative movements and types of fault.
- (vi) Definition and types of joints.
- (vii) Definition, types and significance of unconformities.

General Stratigraphy and Indian Stratigraphy UnitII:

50 Periods: 20 Marks

- Definition, Principles and units of Stratigraphy.
- Development and sub divisions of Geological time scale and factors of stratigraphic correlation.
- (iii) Geomorphic divisions of India.
- (iv) Study of following stratigraphic systems of India-Dharwar system of Mysore, Vindhyan system of sone Valley, Gondwana system and Tertiaries of N.E. India (Assam and Manipur)

Unit III: Petrology

50 Periods: 20 Marks

- Definition and types of rocks-Igneous, Sedimentary and Metamorphic and the Criteria for distinguishing them in hand specimens.
- Magma-definition and composition.
- Igneous rock-Intrusive and extrusive forms and study of texture, structures, classification of igneous rocks based on Chemical composition, mineralogical composition and mode of occurence.

(iv) Sedimentary rocks-Environment of deposition, Classification of Sedimentary rocks into Clastic and Non-clastics, Structure and texture of Sedimentary rocks.

- (v) Metamorphic rock-agents and types of Metamorphism, study of simple structure and texture of Metamorpic rocks.
- (vi) Study of mineralogical, structural feature and mode of occurrence of the following rock types-Granite, Dolerite, Diorite, Gabbro, Dunite, Peridotite, Pegmatite, Rhyolite, Basalt, Slate, Schist Gneiss, Marble Quartzite, Sandstone, Limestone, Shale, Conglomerate.

Unit IV: Applied Geology

40 Periods: 15 Marks

- Elementary knowledge of Mineral deposits, mineral exploration and prospecting
- (ii) Soil erosion causes and its prevention.
- (iii) Landslide causes and its prevention.
- (iv) Geology of underground water.
- (v) Selection of construction materials.
- (vi) Site selection of dam construction.

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GEOLOGY

CLASS-XII PRACTICAL

One Paper 3 Hours 30 Marks

Unit	Unitwise Weightage	Marks
I.	Geological Maps	10 marks
II.	Rock hand specimens	08 marks
III.	Geographical distribution of Stratigraphic System	02 marks
IV.	Geological field report	04 marks
V.	Practical Note Book	04 marks
VI.	Viva-Voce	02 marks

Experiments:

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(i)	Determination of strike direction, dip direction and amount of dip of an incline surface with the help of clinometer compass.	02 marks
(ii)	Description of geological map and drawing of profile.	08 marks
(iii)	Recognition of rock hand specimens of the following-Granite, Gabbro, Doletrite, Dunite, Peridotite, Pegmatite, Rhyolite, Basalt, Slate, Schist, Marble, Quartzite, Sandstone, Limestone, Shale, Conglomerate.	08 marks
(iv)	Geographical distribution of the following stratigraphic systems-Dharwar system; Vindhyan system of sone valley, Gondwana system, Tertiaries of N.E. India.	02 marks
(v)	Geological Field Report-Field work is compulsory and reports of the field work are to be submitted at the time of examination.	4 marks
	No student can appear practical examination without submittion of field report.	
(vi)	Practical Note Book.	04
(vii)	Viva-Voce.	02

Prescribed Textbook for Classes XI & XII:

- 1. Text Book of Geology P.K. Mukherjee (The world Press Pvt. Ltd. Calcutta)
- 2. Text Book of Geology G.B. Mahapatra (C.B.S. Publisher and Distributor, New Delhi)
- 3. Laboratory Manual of Geology A.K. Sen (Modern Book Agency Pvt. Ltd. Calcutta)

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Reference Books for Classes XI & XII:

- Physical Geology Dutta A.K.
 (Modern Book Agencies Ptv. Ltd. Calcutta)
- 2. Economic Geology Sen and Guha (Modern Book Agencies Ptv. Ltd. Calcutta)
- 3. Principles of petrology Tyrrel G.W. (B.I. Publication Pvt. Ltd. New Delhi)
- 4. Text Book of Palaeontology-Woods (C.B.S. Publisher and Distributor, Delhi)
- 5. Rutley's Elements of Mineralogy-Read N.H. (C.B.S. Publisher and Distributor, Delhi)
- 6. Structural Geology M.P. Billings (Prentice Hall of India Ltd. New Delhi)

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DESIGN QUESTION PAPER/UNIT TEST

Subject : GEOLOGY

Unit/Paper : Theory
Class : XII

Time: 3 Hours

Full Marks: 70

I	WEIGHTAGE TO OBJECTIVES:							
	Obje	ectives	K	U		А	S	Total
	Perc	entage of Marks	35	45		15	05	100
	Marl	KS	25	31		10	04	70
I.	WE]	GHTAGE TO FORM	OF QUEST	IONS :				
	Forn	ns of Questions	E	SA-I	SA-I	I VS	A O	Total
•	No. o	of Questions	03	07	10	10	04	34
•	Marl	ks Allotted	15	21	20	10	04	70
i	Estin	nated Time (in Minutes)	60	42	40	30	08	180
ш.	WEI	GHTAGE TO CONTE	ENT:					
•			Units/Sul	o-units				Marks
	1.	Structural Geology						15
	2.	General Stratigraphy and	d Indian Stra	tigraphy				20
	3.	Petrology						20
	4.	Applied Geology						15
							Total:	70
IV.	SCH	EME OF SECTION :	MIL					
V.	SCH	EME OF OPTIONS:	Nil					
VI.	DIF	FICULTY LEVEL:						
		Diffici	lt : 15% n	narks				
	Average : 50% marks							
		Eas	sy : 35% n	narks				

Abbreviation: K (Knowledge), U (Understanding), A (Application),

S (Skill), E (Essay Type),

VSA (Very Short Answer Type), O (Objective Type)

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SA (Short Answer Type),

DESIGN QUESTION PAPER/UNIT TEST

Subject : GEOLOGY Unit/Paper : Practical

Class: XII Time: 3 Hours

Full Marks: 30

	run.	viains .	30					
WE	IGHTAGE TO OBJECTI	VES :						
Obj	ectives	K U			А	S	Total	
Pero	centage of Marks	13	20		27	40	100	
Mai	ks	04	06		08	12	30	
WE	IGHTAGE TO FORM O	F QUEST	IONS :					
For	ms of Questions	E	SA-I	SA-II	VSA	A 0	Total	
No.	of Questions	03	06	04	02	-	15	
Maı	ks Allotted	12	12	04	02	-	30	
Esti	mated Time (in Minutes)	60	90	20	10	-	180	
WE	IGHTAGE TO CONTEN	T:			•	•		
		Units/Sul	o-units				Marks	
1.	Determination of dip and s	trike					2	
2.	Geological mapping						8	
3.	Identification of rock and s	specimens					8	
4.	Stratigraphical distribution	of systems	S				2	
5.	Geological field report						4	
6.	Practical Note book						4	
7.	Viva Voce						2	
						Total:	30	
SCF	HEME OF SECTION :	Nil						
SCI	HEME OF OPTIONS:	Nil						
DIE	FFICULTY LEVEL:							
	Difficult	: 15% r	marks					
	A verage	: 50% r	marks					
Easy : 35% marks								
	Obj Pero Mai WE Forn No. Mai Esti WE 1. 2. 3. 4. 5. 6. 7.	WEIGHTAGE TO OBJECTIVE Objectives Percentage of Marks Marks WEIGHTAGE TO FORM OF Forms of Questions No. of Questions No. of Questions Marks Allotted Estimated Time (in Minutes) WEIGHTAGE TO CONTEN 1. Determination of dip and second	WEIGHTAGE TO OBJECTIVES: Objectives K Percentage of Marks 13 Marks 04 WEIGHTAGE TO FORM OF QUEST Forms of Questions E No. of Questions 03 Marks Allotted 12 Estimated Time (in Minutes) 60 WEIGHTAGE TO CONTENT: Units/Sult. 1. Determination of dip and strike 2. Geological mapping 3. Identification of rock and specimens 4. Stratigraphical distribution of system. 5. Geological field report 6. Practical Note book 7. Viva Voce SCHEME OF SECTION: Nil SCHEME OF OPTIONS: Nil DIFFICULTY LEVEL: Difficult: 15% r Average: 50% r	Objectives K U Percentage of Marks 13 20 Marks 04 06 WEIGHTAGE TO FORM OF QUESTIONS: Forms of Questions E SA-I No. of Questions 03 06 Marks Allotted 12 12 Estimated Time (in Minutes) 60 90 WEIGHTAGE TO CONTENT: Units/Sub-units 1. Determination of dip and strike 2. Geological mapping 3. Identification of rock and specimens 4. Stratigraphical distribution of systems 5. Geological field report 6. Practical Note book 7. Viva Voce SCHEME OF SECTION: Nil SCHEME OF OPTIONS: Nil DIFFICULTY LEVEL: Difficult: 15% marks Average: 50% marks	WEIGHTAGE TO OBJECTIVES: Objectives K U Percentage of Marks 13 20 Marks 04 06 WEIGHTAGE TO FORM OF QUESTIONS: Forms of Questions E SA-I SA-II No. of Questions 03 06 04 Marks Allotted 12 12 04 Estimated Time (in Minutes) 60 90 20 WEIGHTAGE TO CONTENT: Units/Sub-units 1. Determination of dip and strike 2. Geological mapping 3. Identification of rock and specimens 4. Stratigraphical distribution of systems 5. Geological field report 6. Practical Note book 7. Viva Voce SCHEME OF SECTION: Nil SCHEME OF OPTIONS: Nil DIFFICULTY LEVEL: Difficult: 15% marks Average: 50% marks	WEIGHTAGE TO OBJECTIVES: Objectives K U A Percentage of Marks 13 20 27 Marks 04 06 08 WEIGHTAGE TO FORM OF QUESTIONS: Forms of Questions E SA-I SA-II VSF No. of Questions 03 06 04 02 Marks Allotted 12 12 04 02 Estimated Time (in Minutes) 60 90 20 10 WEIGHTAGE TO CONTENT: Units/Sub-units 1. Determination of dip and strike 2. Geological mapping 3. Identification of rock and specimens 4. Stratigraphical distribution of systems 5. Geological field report 6. Practical Note book 7. Viva Voce SCHEME OF SECTION: Nil SCHEME OF OPTIONS: Nil DIFFICULTY LEVEL: Difficult: 15% marks A verage: 50% marks	WEIGHTAGE TO OBJECTIVES: Objectives K U A S Percentage of Marks 13 20 27 40 Marks 04 06 08 12 WEIGHTAGE TO FORM OF QUESTIONS: Forms of Questions E SA-I SA-II VSA O No. of Questions 03 06 04 02 - Marks Allotted 12 12 04 02 - Estimated Time (in Minutes) 60 90 20 10 - WEIGHTAGE TO CONTENT: Units/Sib-units 1. Determination of dip and strike 2. Geological mapping 3. Identification of rock and specimens 4. Stratigraphical distribution of systems 5. Geological field report 6. Practical Note book 7. Viva Voce Total: SCHEME OF SECTION: Nil DIFFICULTY LEVEL: Difficult: 15% marks A Verage: 50% marks	

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VSA (Very Short Answer Type), O (Objective Type)