



*Sample Paper
&
Question Paper Pattern*

2022
2023

GOA BOARD

GOA BOARD OF SECONDARY AND HIGHER SECONDARY EDUCATION

**Matter pertaining to scheme of evaluation in Geology for STD XII for the academic year
2022-2023**

Scheme In General
Board Examination- marks-90
Internal Assessment- marks-10
Total-100

Pattern of board examination (External Component)

Examination	Total Marks	Type of questions	Topic/Unit	Marks allotted	weightage
First semester	40	M.C.Q. 40 questions carrying 1mark each	1.EconomicGeology	12	30%
			2.Structural Geology	16	40%
			3.Petrology	12	30%
Second semester	30	Subjective questions carrying 1,2,3 and 4 marks	3.Dynamical Geology	15	50%
			4.Stratigraphy 5.paleontology	15	50%
Practical coarse	20	As per the draft circulated	As per the draft circulated	20	
Total	90			90	

Pattern of internal Assessment

Test	Total Marks	Type of questions	Topic/Unit
First test	20	Subjective questions carrying 1,2,3 and 4 marks	Economic Geology
Second test	20	Subjective questions carrying 1,2,3 and 4 marks	Structural Geology Petrology
Third test	20	Different innovative topics related to Geology*	Presentations/ creations/other innovative ideas
Total	60		

60 marks to be calculated out of 10

Suggested topics for third test (innovative type)

- 1. Individual collection of rock samples**
- 2. Individual collection of mineral samples**
- 3. Preparation of mineral map of India**
- 4. Preparation of Geological models/ chart of India**
- 5. Collection of different type of soil samples**
- 6. Individual Collection of photographs of Geological features.**

Note:

The teacher is free to suggest innovative ideas to students or is free to accept ideas suggested by students other than those mentioned above.

**GOA BOARD OF SECONDARY AND HIGHER SECONDARY
EDUCATION**

MODEL QUESTION PAPER 2ND TERM- SUBJECTIVE

STD: XII Science

MAX. MARKS: 30

Total No. of Questions-14

Subject: GEOLOGY

TIME: 90 MINUTES

INSTRUCTIONS:

- (i) All questions are compulsory.*
- (ii) Draw neat labeled diagram wherever necessary.*
- (iii) Answer each question on a fresh page*
- (iv) Figures to the right indicate full marks.*
- (v) The question paper consists of FOUR SECTIONS. A,B,C and D*
 - a. Section A has 04 questions 01 mark each*
 - b. Section B has 05 questions 02 mark each*
 - c. Section C has 04 questions 03 mark each*
 - d. Section D has 01 questions 04 mark each*
- (vi) The total number of questions in the paper are 14*
- (vii) Select the proper alternative for multiple choice type questions and write the completed statement. Multiple choice type questions should be attempted only once*
- (viii) Answer to the questions carrying 1, 2, 3, and 4 marks should be written in 1 to 10, 50, 80 and 120 words.*

Section A

- | | | |
|---|--|---|
| 1 | Name the youngest Supergroup of Peninsular India. | 1 |
| 2 | At what depth do we encounter Earth's outer core? | 1 |
| 3 | What type of mountains are formed under tensional stress? | 1 |
| 4 | State the fundamental time unit with reference to standard Geological time scale | 1 |

Section B

- | | | |
|---|---|---|
| 5 | Fossils are rare in nature. Explain | 2 |
| 6 | 'Earth's outer core is in fluid state' Justify. | 2 |
| 7 | Differentiate between 'shield' and 'cinder' cones with reference to volcanoes | 2 |
| 8 | Explain the geological features of peninsular India. | 2 |
| 9 | Illustrate and Explain 'Isoseismal lines' | 2 |

Section C

- | | | |
|----|--|---|
| 10 | Illustrate and Explain
Principle of intrusion
Principal of inclusion | 3 |
| 11 | Draw a neat diagram and explain features of divergent plate boundary | 3 |
| 12 | Write a brief note on 'Mesozoic Era'. | 3 |
| 13 | Explain the concept of index fossils and its use | 3 |

Section D

- | | | |
|----|---|---|
| 14 | Explain the procedure for the location of the epicenter of an earthquake.
Or
Illustrate and explain the Himalayan mountain system | 4 |
|----|---|---|

The weightage or the distribution of marks over different dimensions of the question paper shall be as follows:

1. **WEIGHTAGE TO LEARNING OUTCOMES:**

SR.NO.	LEARNING OUTCOMES	MARKS	PERCENTAGE OF MARKS
1.	KNOWLEDGE	09	30
2.	UNDERSTANDING	12	40
3.	APPLICATION	06	20
4.	SKILL	03	10
	TOTAL	30	100

2. **WEIGHTAGE TO CONTENT/SUBJECT UNITS:**

SR.No.	Units	Marks
1.	DYNAMICAL GEOLOGY	15
2.	STRATIGRAPHY & PALAEONTOLOGY	15
	TOTAL	30

3. **WEIGHTAGE TO FORMS OF QUESTIONS:**

SR.NO	Form of Questions	Marks for each question	Number of questions	Total Marks
1.	Long Answer Type (LA)	04	01	04
2.	Short Answer Type (SA-I)	02	05	10
3.	Short Answer Type (SA-II)	03	04	12
4.	Very Short Answer Type(VSA)	01	02	02
5	Multiple choice question	01	02	02
	Total		14	30

The expected time for different types of question would be as follows:

SR.N O.	Form of Questions	Approx. time for each Question in mins (t)	Number of questions (n)	Approx. time for each form of Questions in mins (n x t)
1.	Long Answer Type (LA) (04)	12	01	12 x 01 = 12
2.	Short Answer Type (SA-I) (02)	06	05	06 x 05 = 30
3.	Short Answer Type (SA-II) (03)	10	04	10 x 04 = 40
4.	Very Short Answer type (VSA) (01)	02	04	02 x 04 = 08
	Total		14	90 Minutes

**GOA BOARD OF SECONDARY AND HIGHER SECONDARY
EDUCATION**

**Matter pertaining to scheme of evaluation in Geology for STD XII (Practical) for the
academic year 2022-2023**

Sr.No	Syllabus	Total Marks
1	Description and identification of Economic Minerals	4
2	Description and identification of rocks	4
3	Description and identification of Structural Geology models	4
4	Study of Geological Maps	4
5	Study of Survey of India Topographic maps	2
6	Journal and Viva	2
		20

**GOA BOARD OF SECONDARY AND HIGHER SECONDARY
EDUCATION GEOLOGY SYLLABUS STD XII**

Unit	Contents/sub topics	Period
I	Dynamical Geology	
1	Earthquakes- introduction, Focus Epicentre ,seismic waves ,P.S.L waves, magnitude ,brief mention of Richter scale ,Intensity ,Iseismal, causes of earthquakes ,Elastic Rebound theory ,location of Epicentre of earthquakes, global distribution of Earthquakes ,risk zones map of India.	8
2	Internal structure of the earth- Introduction seismological evidence ,behaviour of body waves ,shadow zone ,discontinuities, internal structure of the earth as continental crust, oceanic crust, upper mantle ,lower mantle ,outer core ,inner core with respect to their composition thickness and depth.	3
3	Volcanoes- Definition causes of volcanism ,classification based on continuity of eruption, types of eruptions, types of volcanic cones, products of volcanoes ,Deccan trap of volcanism, post of volcanic phenomena hot spring geysers etc.	5
4	Mountains – Introduction, classification, as tectonic mountains, volcanic mountains, dome mountains, fold mountains, block mountains, non-tectonic residual mountains with their mode of origin, and examples.	4
5	Plate Tectonics and mountain building- Introduction, divergent, convergent. And strike slip boundaries convergent boundaries-ocean-ocean, ocean-continent and continent-continent interactions with diagrams. Himalayan orogeny, sea of Tethys.	4
		16

II	Structural Geology	
1	Strike And Dip -Introduction to basic terms outcrop, bedding, dip, and strike, dip amount, dip direction, apparent and true dip, clinometer compass its use.	2
2	Folds -Introduction, definition, parts of folds into axis, axial plane, width, height and plunge, study of following types of folds- Anticline ,syncline ,overturned, isoclinal. Recumbent, fan and monocline, importance study of folds	6
3	Faults -Introduction ,definition, elements of faults, faults plane, hanging wall and foot wall throw and heave ,Genetic classification of faults, Geometrical classification of fault ,thrust fault, block fault ,step fault ,importance of studying fault.	6
4	Joint – Definition ,terms such as master joint, joint system, geometric classification, strike joint, dip joint, oblique joint bedding joint, genetic classification i.e. tension and shear joints.	3
5	Unconformities -Definition ,concept, stages of development of a) angular unconformity b) Non conformity c) disconformity , various possible fields situations .	4
		21
III	Petrology -	
1	Igneous Rocks – Introduction, Textures- degree of crystallization, granularity, shape of the crystals, equigranular and inequigranular texture, porphyritic and Poikilitic textures, directive and intergrowth textures. Classification chemical- based on silica percentage and silica saturation mineralogical classification formation of igneous rocks, Bowen's reaction series factors governing crystallization, broad tabular classification.	7

2	Sedimentary Rocks- Introduction, environment of formation, textures of sedimentary rocks, classification based on origin and grain size.	4
3	Metamorphic Rocks- Introduction, kinds and agents of metamorphism, progressive metamorphism of shale, metamorphic scale, metamorphic grades, metamorphic zone, study of metamorphic fabric such as salty phyllitic schistose and gneissose rocks	4
		15
IV	Palaeontology and stratigraphy	
1	Fossils- Introduction, concepts and various modes of preservation of fossils ,importance of fossils ,uses of fossils in palaeo-geography palaeo climate and palaeo tectonics ,concept of index fossils and its use in stratigraphy	4
2	Stratigraphy- Introduction ,principal of stratigraphy such as inclusions, intrusion and uniformitarianism and their applications, stratigraphic correlation- introduction, elements of correlation such as time unit, time stratigraphic units and litho-stratigraphic units Methods of co relation and radioactive methods.	7
3	Standard Geological Time scale- study of geological time scale with respect to various evolutionary changes and time spans of various time units' study of Palaeozoic, Mesozoic and Cenozoic Era.	3

4	Brief outline of stratigraphy of peninsular India- physiographic divisions of India. Study of following Supergroups' with respect to their distribution, classification (upto group level) lithology and economic importance (a) Dharwar Supergroup (b) Cuddappah Supergroup (C) Vindhayan Supergroup (d) Gondawana Supergroup (e) Deccan Traps .Brief outline of stratigraphy of Goa.	6
		20
	Economic Geology	
1	Introduction- Basic terms such as Ore, Gangue, Ore Minerals Beneficiation and Tenor ,cut-off grade	2
2	Origin of ore deposits- Syngenetic and epigenetic deposits, igneous deposits, pegmatite deposits, Hydrothermal deposits, Metasomatic deposits, sedimentary deposits, Metamorphic deposits.	10
3	Petroleum- Definition, chemical composition origin, organic theory, accumulation and Indian distribution. Coal-Introduction, classification as peat, lignite, bituminous and Anthracite, formation of coal, Indian distribution.	4
4	Distribution of economic minerals in India - Metallic Minerals (a) Aluminium Ore (b) Copper Ore (C) Chromium Ore (d) Gold (e) Iron Ore (f) Manganese Ore (g) Lead zinc. Non-metallic minerals (a) Gypsum (b) Bartye (c) Mica (d) Radioactive minerals	5
5	Economic minerals wealth of Goa - Brief outline of Goa mining industry with respect to Iron, Manganese and Aluminium deposits with their distribution.	3
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GEOLOGY PRACTICAL COURSE FOR STD XII SCIENCE		
Sr. No	CONTENTS	No .of practical sessions
1	Description and identification of the following economic minerals with respect to physical properties, chemical composition, occurrence and use.	4
	Metallic Mineral:	
	Iron Ore :- Hematite, Magnetite, Pyrite, Limonite	
	Manganese Ores :-Pyrolusite , psilomelane	
	Copper Ore:- Chalcopyrite	
	Lead Ore :- Galena	
	Chromium Ore :- Chromite	
	Aluminium Ore :- Bauxite	
	Non Metallic Minerals :-	
	Gypsum , Graphite, Barite, Asbestos Biotite, Muscovite, Talc	
	Amethyst, Kyanite, calcite	
2	Description and identification of the following rock types.	3
	Igneous Rocks:- Pegmatite, granite, Rhyolite, Syenite, Trachyte, Micro Granite, diorite, Gabbro Basalt, Pyroxenite, Dolerite along with Porphyritic varieties.	
	Sedimentary rocks :- Breccia, Conglomerate, Sandstone, Shale, Limestone, Coal, Bauxite, Laterite	
	Metamorphic rocks: - Slate, Phyllite, Schist (at least three varieties), Gneiss Marble, Quartzite.	
3	Study of Structural geological Models :-	4
	Strike and dip:-	
	Folds:- Anticline Syncline (symmetrical and asymmetrical), Isoclinals, Fan, Recumbent, Monocline.	

	Faults: - Normal Fault, Reserve fault, Step fault, and Block Fault.	
	Unconformities :-Angular, Disconformities, and non-conformity	
4	Study of Geological maps with cross sections having horizontal sequence and vertical instructions (at least six maps)	3
5	Study of survey of India topographic maps with respect to marginal information, relief, drainage and vegetation [at least 5 maps]	2
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