

**SAMPLE QUESTION PAPER - I**

# **GEOLOGY**

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**Class - XII**



**Government of Kerala  
Department of Education**

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**Prepared by  
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# ***Guidelines for the Preparation of Question Paper for HIGHER SECONDARY EDUCATION 2015-16***

## **Introduction**

Term evaluation is an important aspect of Continuous and Comprehensive Evaluation (CCE). It covers the **assessment of learning** aspect of the CCE. The Kerala School Curriculum 2013 postulated that the examination system should be recast so as to ensure a method of assessment that is a valid, reliable and objective measure of student development and a powerful instrument for improving the learning process. The outcome focused written tests are being used as tools for terminal assessment. Practical assessment is also considered for some subjects. The syllabus, scheme of work, textual materials, teacher texts and learning experiences may be considered while developing tools for term evaluation.

In order to make the examination system effective and objective, quality of the question paper needs to be ensured. Questions of different types considering various learning outcomes, thinking skills and of varying difficulty levels are to be included in the question paper. This makes question paper setting a significant task that has to be undertaken with the support of proper guidelines.

The guidelines for the preparation of the question paper have been divided into four heads for its effective implementation and monitoring. The areas are **i) preparatory stage, ii) nature of questions, iii) question paper setting and iv) structure of the question paper.**

### **I. Preparatory stage**

Before starting the process of question paper setting, the question paper setter should ensure that she/he has:

- Familiarised the current syllabus and textbook of the concerned subject.
- secured the list of Los (Learning Outcomes) relating to the subject.
- acquired the list of thinking skills applicable to the subject.
- prepared a pool of questions from each unit of the subject.
- verified the scheme of work and weight of score for each unit/lesson.
- gone through guidelines for the preparation of question paper for higher secondary education 2014-15.

### **II Nature of questions**

Questions selected from the pool to be included in the question paper should reflect the following features:

- stem of the question text should be relevant to the question posed.
- multiple choice questions should be provided with four competitive distracters.
- the possibilities of higher order thinking skills should be considered while setting MCQs
- time allotted for each question should be justified according to the thinking skills involved.
- the scope and length of the answer should be clearly indicated.

- questions should be prepared by considering the learning level of the learner.
- the question should focus on the learning outcomes.
- a wide range of thinking skills and learning outcomes from each unit/lesson should be considered.
- varied forms of questions should be covered.
- there should be a balance between the time allotted and the level of question.
- question should be very specific and free from ambiguity.
- question text should not be too lengthy and complicated.
- questions can be prepared based on a single or a cluster of learning outcomes which is scattered over one particular unit or units.
- cluster of learning outcomes from different units can be considered only for graded questions (questions with sub-divisions).
- the possibilities of graded questions reflecting different thinking skills can be explored.
- while preparing questions for language papers importance should be given to the language elements, language skills, discourses, textual content and elements of creativity.
- while preparing questions for subjects other than languages, importance should be given to content, concepts and skills.
- questions should cater the needs of differently abled learners and CWSEN (Children With Special Education Needs)
- the questions should contain varied forms such as objective type with specific focus to multiple choice test items and descriptive types (short answer and essay types).
- directions regarding the minimum word limit for essay type questions should be given.
- sufficient hints can be provided for essay type questions, if necessary.
- maximum usage of supporting items like pictures, graphs, tables and collage may be used while preparing questions.
- questions which hurt the feelings of caste, religion, gender, etc. must be completely avoided.

### III. Question paper setting

During the process of question paper setting the question setter should:

- prepare a design of the question paper with due weight to content, learning outcomes, different forms of questions and thinking skills.
- prepare a blue print based on the design.
- prepare scoring key indicating value points and question based analysis along with the question paper.
- while preparing scoring key, thinking skills should also be integrated.
- 60% weight should be given to thinking skills for conceptual attainment and 40% to thinking skills for conceptual generation.
- 15 to 20% weight of total scores must be given to objective type questions and up to 20% weight of total score must be given to essay type questions.

- the highest score that can be given to a question in the question paper is limited to 10% of the total score.
- while fixing the time for answering a question, time for reading, comprehending and writing the answer must be considered.
- The total time limit of the question paper - two hours for 60 scores and 2.30 hours for 80 scores question papers with an extra cool-off time of 15 minutes.

#### IV. Structure of the question paper

The question paper should reflect the following features in general:

- general instructions for the question paper should be given on the top.
- instructions for specific questions can be given before the question text.
- monotony of set patterns (objective or descriptive) should be avoided.
- questions should be prepared in bilingual form.
- there should not be any mismatch between the bilingual versions of the questions.
- choice can be given for questions up to 20% of the total score.
- while giving choice, alternative questions should be from the same unit with the same level of thinking skills.
- in the case of languages, language of the questions and answers should be in the particular language concerned. Necessary directions in this regard must be given in the question paper.

### THINKING SKILLS

Category/ processes	Alternative terms
<b>1. Remember</b>	<b>Retrieve relevant knowledge from long-term memory</b>
1.1. <i>Recognising</i>	identifying- (e.g. Recognize the dates of important events in Indian history)
1.2. <i>Recalling</i>	retrieving - (e.g. Recall the major exports of India)
<b>2. Understand</b>	<b>Construct meaning from instructional messages, including oral, written and graphic information</b>
2.1. <i>Interpreting</i>	clarifying, paraphrasing, representing, translating (e.g. Write an equation [using B for the number of boys and G for the number of girls] that corresponds to the statement ‘There are twice as many boys as girls in this class’)
2.2. <i>Exemplifying</i>	illustrating, instantiating (e.g. Locate an inorganic compound and tell why it is inorganic)
2.3. <i>Classifying</i>	categorizing, subsuming (e.g. Classify the given transactions to be recorded in Purchase returns book and Sales returns book)
2.4. <i>Summarising</i>	abstracting, generalizing (e.g. Students are asked to read an untitled passage and then write an appropriate title.)
2.5. <i>Inferring</i>	concluding, extrapolating, interpolating, predicting (e.g. a student may be given three physics problems, two involving one principle

and another involving a different principle and ask to state the underlying principle or concept the student is using to arrive at the correct answer.)

2.6. *Comparing* contrasting, mapping, matching (e.g. Compare historical events to contemporary situations)

2.7. *Explaining* constructing models (e.g. the students who have studied Ohm's law are asked to explain what happens to the rate of the current when a second battery is added to a circuit.)

<b>3. Apply</b>	<b>Carry out or use a procedure in a given situation</b>
3.1. <i>Executing</i>	Carrying out (e.g. Prepare Trading and Profit and loss Account from the Trial Balance given and find out the net profit.)
3.2. <i>Implementing</i>	using (e.g. Select the appropriate given situation where Newton's Second Law can be used)
<b>4. Analyse</b>	<b>Break material into its constituent parts and determines how the parts relate to one another and to an overall structure or purpose</b>
4.1. <i>Differentiating</i>	discriminating, distinguishing, focusing, selecting (e.g. distinguish between relevant and irrelevant numbers in a mathematical word problem)
4.2. <i>Organising</i>	finding coherence, integrating, outlining, parsing, structuring (e.g. the students are asked to write graphic hierarchies best corresponds to the organisation of a presented passage.)
4.3. <i>Attributing</i>	deconstructing (e.g. determine the point of view of the author of an essay in terms of his or her ethical perspective)
<b>5. Evaluate</b>	<b>Make judgements based on criteria and standards</b>
5.1. <i>Checking</i>	coordinating, detecting, monitoring, testing (e.g. after reading a report of a chemistry experiment, determine whether or not the conclusion follows from the results of the experiment.)
5.2. <i>Critiquing</i>	judging (e.g. Judge which of the two methods is the best way to solve a given problem)
<b>6. Create</b>	<b>Put elements together to form a coherent or functional whole; reorganize elements into a new pattern or structure</b>
6.1. <i>Generating</i>	hypothesizing (e.g. suggest as many ways as you can to assure that everyone has adequate medical insurance)
6.2. <i>Planning</i>	designing (e.g. design social intervention programmes for overcoming excessive consumerism)
6.3. <i>Producing</i>	constructing (e.g. the students are asked to write a short story based on some specifications)

Considering the intellectual level of learners, while setting the question paper;

- 1. 60% weight may be given to thinking skills used for factual and conceptual attainment and**
- 2. 40% weight may be given to thinking skills for conceptual generation** (higher thinking skills has to be ensured in this category). Thinking skills for conceptual generation means thinking skills needed for elaborating the concepts.

***Refer the range of thinking skills given above. We can include the thinking skills no.1.1 to 3.2 (11 processes) under first category and 4.1 to 6.3 (8 processes) under second category.***

## Guidelines for setting question paper - Geology

1. Unit- wise weight allotted to set questions should be followed.
2. Objective type questions shall carry one score.
3. The short answer questions should carry two or three scores.
4. The weight of essay type questions should be between 15%- 20% of the total scores and it should carry four or five scores.
5. Multi level questions shall be promoted. Each sub question can be given separate scores.
6. Specific hints shall be given to answer the questions if needed.
7. Diagrams, charts and figures may be included wherever necessary.
8. The content areas given in the trivia boxes within the text book should not be taken for term end evaluation.

## LEARNING OUTCOMES

### **1. ROCKS**

- 1.1 Distinguishes between the three basic types of rock found on the Earth's crust.
- 1.2 States the formation of igneous rocks.
- 1.3 Explains the textural and compositional differences exhibited by igneous rocks.
- 1.4 Identifies common igneous rocks in hand specimens.
- 1.5 Explains the formation and classification of sedimentary rocks.
- 1.6 Identifies the common sedimentary rocks megascopically.
- 1.7 Describes the agents and types of metamorphism.
- 1.8 Identifies the common types of metamorphic rocks.
- 1.9 Illustrates diagrammatically the concept of rock cycle.

### **2. ECONOMIC MINERAL DEPOSITS**

- 2.1 Delineates the conditions to treat mineral deposits as ores.
- 2.2 Describes the formation of mineral deposits associated with magmatic concentrations.
- 2.3 Explains the ways of formation of hydrothermal mineral deposits.
- 2.4 States the processes that produce sedimentary deposits.
- 2.5 Distinguishes between residual and placer mineral deposits.
- 2.6 Identifies metamorphism as a mode of mineral formation.
- 2.7 Discusses the formation of mineral deposits associated with contact metasomatism.
- 2.8 Identifies major metallic and non-metallic mineral specimens based on their salient physical properties.
- 2.9 Mentions the uses of some major industrial minerals.

### **3. FOSSIL FUELS**

- 3.1 Recognises the significance of fossil fuels as a non-renewable source of energy
- 3.2 Describe the origin and types of coal
- 3.3 Explains the processes involved in the formation of petroleum and natural gas
- 3.4 Makes an appraisal of the distribution of fossil fuels in India

3.5 Evaluates the environmental issues associated with the consumption of fossil fuels

#### **4. GEOLOGICAL STRUCTURES**

4.1 Explains the meaning of linear and planar features exhibited by rocks.

4.2 Measures the attitude of beds in terms of dip and strike.

4.3 Demonstrates the basic concepts of rock deformation which results in secondary structures in rock masses.

4.4 Recognizes important large scale structures such as fold, fault, joints and unconformities.

4.5 Illustrates basic types of fold, fault, joints and unconformities.

#### **5. HISTORY OF THE EARTH**

5.1 Explains the necessary conditions for preservation of fossils in rock strata.

5.2 Summarizes the different modes of fossilization.

5.3 Describes the significance of fossils in stratigraphy.

5.4 Understands the concept of geologic time and its usefulness in understanding the history of the Earth.

5.5 Establishes the difference between the determination of relative age and absolute age of geological events.

5.6 States the principles of stratigraphy that are employed to determine relative age of rocks.

#### **6. GEOLOGY AND ENVIRONMENT**

6.1 Explains the importance of environment for sustaining life on Earth.

6.2 Realizes the interaction among various sub systems of the Earth.

6.3 Establishes the significance of geology in environmental management.

6.4 Delineates the effects of mining on different spheres of the Earth.

6.5 Describes the impacts of sand mining on our environment.

6.6 Locates the major sources of contamination of ground water.

6.7 Appraises the problems associated with saline water intrusion.

6.8 Examines the consequences of green house effect and global warming.

6.9 Recognizes the need of conservation of natural resources for sustainable development.



## **7. EARTHQUAKES**

- 7.1 Describes the mode and causes of earthquakes.
- 7.2 Explains the occurrence of earthquakes along the plate boundaries.
- 7.3 Draws the major seismic belts of the world.
- 7.4 Discriminates among different types of seismic waves.
- 7.5 Illustrates seismographs and seismograms.
- 7.6 Compares the magnitude and intensity scales of measuring the size of an earthquake.
- 7.7 Identifies the effects of earthquakes as a natural calamity.

## **8. GEOLOGICAL HAZARDS AND DISASTER MANAGEMENT**

- 8.1 Defines the terms associated with disaster management such as hazard, disaster, vulnerability, risk and capacity
- 8.2 Describes the various phases of the disaster management cycle
- 8.3 Identifies the steps to be taken to minimize the risks associated with earthquakes.
- 8.4 Draws a conclusion about the mitigation of tsunami hazards.
- 8.5 Explains the effects, and mitigation of volcanic disasters.
- 8.6 States the causes, adverse effects and mitigation of flood hazards
- 8.7 Demonstrates the controlling factors and mitigation strategies of landslides.
- 8.8 Illustrates the causative factors of coastal erosion and evaluates the strategies of coastal zone management

## Syllabus (theory)

### **1. ROCKS**

Definition of rock, broad classification of rocks into igneous, sedimentary and metamorphic rocks.

Igneous rocks, magma and lava; classification of igneous rocks- plutonic, hypabyssal and volcanic rocks, plutons; textures of igneous rocks-granularity, crystallinity, glassy and frothy textures; classification of igneous rocks based on composition- felsic, intermediate, mafic and ultramafic; crystallization of magma.

Common igneous rocks- granite, rhyolite, pegmatite, diorite, andesite, gabbro, dolerite, basalt and dunite.

Sedimentary rocks, formation and classification of sedimentary rocks- clastic, chemically and organically formed sedimentary rocks; sedimentary textures and structures.

Common types of sedimentary rocks- shale, sandstone, conglomerate; lime stone, chalk and laterite

Metamorphic rocks, agents and types of metamorphism

Metamorphic structures- gneissose, schistose, slaty and granulose structures; common metamorphic rocks- gneiss, schist, slate, marble, quartzite and charnockite

Rock cycle

### **2. ECONOMIC MINERAL DEPOSITS**

Definitions of ore, gangue and grade of an ore.

Common metals and their ores.

Formation of mineral deposits- magmatic, hydrothermal, sedimentary, residual, placer, metamorphic and contact metasomatic deposits with examples.

Study of important metallic minerals- physical properties and chemical composition of hematite, magnetite, chalcopyrite, bauxite, galena and pyrolusite.

Physical properties and industrial uses of some non-metallic minerals- mica, gypsum, asbestos, magnesite, barite, graphite and clay

Mineral based industries in Kerala.

### **3. FOSSIL FUELS**

Coal- origin and types of coal.

Petroleum and natural gas- origin and migration of oil, formation of oil pools, oil traps.

Major oil and gas fields of India.

Oil shale and tar sand.

Impacts of fossil fuels on mankind.

#### **4. GEOLOGICAL STRUCTURES**

Geometrical elements in rock structures- linear and planar structures, attitude of rock units- strike and dip of rock beds.

Rock deformation- stress and strain, types of stress, stages of deformation.

Primary structural features in rocks- bedding or stratification.

Folds- parts of a fold; basic types of fold- anticline and syncline; symmetrical, asymmetrical and overturned folds; recumbent and isoclinal folds.

Faults- parts of a fault; types of fault- normal, reverse, thrust faults and strike-slip faults; horst and graben.

Joints and their types -columnar and sheet joints.

Unconformities and their types- angular unconformity, parallel unconformity (disconformity) and non-conformity.

#### **5. HISTORY OF THE EARTH**

Stratigraphy and Palaeontology; stratigraphic correlation.

Fossils, conditions for preservation of fossils, modes of fossilization and significance of fossils in geology.

Dating of geologic events- relative and absolute dating.

Fundamental principles of historical geology- uniformity, superposition, original horizontality, cross cutting relationship and faunal succession.

Unconformities and their types- parallel unconformity, angular unconformity, disconformities and nonconformity

#### **6. GEOLOGY AND ENVIRONMENT**

Significance of environmental geology; interaction among the Earth's sub-systems.

Impacts of mining and quarrying on lithosphere, hydrosphere, atmosphere and biosphere.

Environmental problems associated with sand mining.

Sources and dangers of groundwater pollution.

Saline water intrusion in coastal areas

Greenhouse effect and global warming.

Sustainable development and conservation of natural resources.

#### **7. EARTHQUAKES**

Causes of earthquakes- faulting, tectonic and non-tectonic causes.

Earthquakes and plate boundaries; seismic belts of the world.

Seismic waves- body waves and surface waves.

Seismograph and seismogram

Earthquake magnitude and intensity - Richter and Mercalli scales

Effects of earthquakes.

## **8. GEOLOGICAL HAZARDS AND DISASTER MANAGEMENT**

Basic concepts in disaster management- hazards and disasters, risk, vulnerability, and capacity.

Phases of disaster management cycle- preparedness, response, recovery and mitigation; prediction and warning.

Mitigation and management of earthquake damages and tsunami hazards.

Types and effects of volcanoes; mitigation of volcanic disasters.

Causes and mitigation of flood hazards; engineering and regulatory approaches of flood mitigation.

Causes and mitigation of landslides.

Causes and mitigation of coastal erosion - hard and soft engineering schemes.

## SCHEME OF WORK

<b>Term</b>	<b>Month</b>	<b>Units</b>
Term - I	June	1. The world of rocks-up to metamorphic rocks
	July	1. The world of rocks- Metamorphic rocks and rock cycle
	August	2. Economic mineral deposits 3. Fossil fuels
Term - II	September	4. Geological structures
	October	5. History of the earth
	November	6. Geology and environment- up to greenhouse effect
	December	6. Geology and environment- green house effect; conservation of mineral resources and sustainable development
Term - III	January	7. Earthquakes
	February	8. Geological hazards and disaster management
	March	Revisions

HSE (II)  
March 2015

Reg No: .....  
Name : .....

SET- 1

**Part - III**  
**GEOLOGY**

Maximum : 60 Scores

Time: 2h

Cool off time : 15 Minutes

**General Instructions to candidates:**

- There is a 'Cool off time' of 15 minutes in addition to the writing time of 2 h.
- You are neither allowed to write your answers nor to discuss anything with others during the 'cool off time'.
- Use the 'cool off time' to get familiar with questions and to plan your answers.
- Read the questions carefully before answering
- All questions are compulsory and only internal choice is allowed.
- When you select a question, all the sub-questions must be answered from the same question itself.
- Calculations, figures and graphs should be shown in the answer sheet itself.
- Malayalam version of the questions is also provided.
- Give equations wherever necessary
- Electronics devices except nonprogrammable calculators are not allowed in the Examination Hall.

**പൊതുനിർദ്ദേശങ്ങൾ**

- നിർദ്ദിഷ്ട സമയത്തിന് പുറമെ 15 മിനിട്ട് 'കൂൾ ഓഫ് ടൈം' ഉണ്ടായിരിക്കും. ഈ സമയത്ത് ചോദ്യങ്ങൾക്ക് ഉത്തരം എഴുതാനോ, മറ്റുള്ളവരുമായി ആശയം വിനിമയം നടത്താനോ പാടില്ല.
- ഉത്തരങ്ങൾ എഴുതുന്നതിന് മുമ്പ് ചോദ്യങ്ങൾ ശ്രദ്ധാപൂർവ്വം വായിക്കണം.
- എല്ലാ ചോദ്യങ്ങൾക്കും ഉത്തരം എഴുതണം.
- ഒരു ചോദ്യനമ്പർ ഉത്തരമെഴുതാൻ തിരഞ്ഞെടുത്തത് കഴിഞ്ഞാൽ ഉപചോദ്യങ്ങളും അതേ ചോദ്യനമ്പറിൽ നിന്ന് തന്നെ തിരഞ്ഞെടുക്കേണ്ടതാണ്.
- കണക്ക് കൂട്ടലുകൾ, ചിത്രങ്ങൾ, ഗ്രാഫുകൾ, എന്നിവ ഉത്തരപേപ്പറിൽത്തന്നെ ഉണ്ടായിരിക്കണം.
- ചോദ്യങ്ങൾ മലയാളത്തിലും നൽകിയിട്ടുണ്ട്.
- ആവശ്യമുള്ള സ്ഥലത്ത് സമവാക്യങ്ങൾ കൊടുക്കണം
- പ്രോഗ്രാമുകൾ ചെയ്യാനാകാത്ത കാൽക്കുലേറ്ററുകൾ ഒഴുകെയുള്ള ഒരു ഇലക്ട്രോണിക് ഉപകരണവും പരീക്ഷാഹാളിൽ ഉപയോഗിക്കാൻ പാടില്ല.

1. a) Which of the following is a non-renewable resource?

- i). Coal                                      ii). Groundwater  
iii). Wind energy      iv). Solar energy  
(1)

b) What are the different grades of coal? Which of these grades contain the least and highest amount of carbon? (2)

c) What are the major concerns about the consumption of fossil fuels? Mention any two solutions to overcome the situation. (3)

1. (എ) തന്നിട്ടുള്ളവയിൽ പുനരുത്പാദിപ്പിക്കപ്പെടാനാകാത്ത പ്രകൃതിവിഭവമേതാണ്?

- (i) കൽക്കരി                                      (ii) ഭൂഗർഭജലം  
(iii) കാറ്റ്    (iv) സൗരോർജ്ജം  
(1)

(ബി)കൽക്കരിയുടെ വിവിധ ഗ്രേഡുകൾ ഏതെല്ലാം? ഇതിൽ കാർബണിന്റെ അളവ് ഏറ്റവും കുറവുള്ളത് ഏതിലാണ്? ഏതിലാണ് ഏറ്റവും കൂടുതലുള്ളത്? (2)

(സി) ഫോസിൽ ഇന്ധനങ്ങളുടെ ഉപഭോഗം മൂലമുള്ള പ്രധാന ഉത്കണ്ഠകൾ ഏതെല്ലാമാണ്? ഈ സാഹചര്യം ഉണ്ടാകാതിരിക്കാൻ രണ്ട് പരിഹാരമാർഗ്ഗങ്ങൾ നിർദ്ദേശിക്കുക. (3)

2. An ore can be considered as a type of rock that contains metallic elements that can be economically extracted from the rock.

- a). What is the name given to the worthless non-metallic minerals found associated with ores? (1)
- b). Distinguish between syngenetic and epigenetic mineral deposits. (2)

3. A. What is the difference between the size of grains in intrusive and extrusive igneous rocks? Why crystals of pegmatite are so large?

OR

B. What does the texture of an igneous rock tell us about its cooling history? (2)

4. Complete the following table on formation of economic mineral deposits. (4)

Process of formation	Examples of mineral deposits
Residual concentration	Bauxite
Beach placer deposits	------(a)-----
------(b)-----	Banded iron formation
------(c)-----	Diamond deposits of South Africa
Metamorphic deposits	------(d)-----

5. A. All major cities of India are situated in flood prone areas. Suggest any two remedial measures to tackle the situation of flood hazards.

2. വാണിജ്യാടിസ്ഥാനത്തിൽ ഉത്പാദിപ്പിക്കാവുന്ന തരത്തിൽ ലോഹങ്ങൾ അടങ്ങിയ ശിലകളാണ് അയിരുകൾ.

(എ) അയിരുകളുടെ കൂടെ കാണപ്പെടുന്ന ഉപയോഗശൂന്യമായ അലോഹ ധാതുക്കൾക്ക് പറയുന്ന പേരെന്താണ്? (1)

(ബി)സിൻജനിറ്റിക് ധാതു നിക്ഷേപങ്ങളും എപിജനിറ്റിക് ധാതുനിക്ഷേപങ്ങളും തമ്മിൽ വേർതിരിച്ചെഴുതുക. (2)

(3) എ. ആന്തര ആഗേയ ശിലകളിലെയും ബാഹ്യ ആഗേയ ശിലകളിലെയും തരികളുടെ വലിപ്പത്തിലുള്ള വ്യത്യാസമെന്താണ്? പെഗ്മാറ്റൈറ്റിലെ മിനറൽ ക്രിസ്റ്റലുകൾ വളരെ വലുതാകുന്നത് എന്തുകൊണ്ടാണ്?

അല്ലെങ്കിൽ

ബി. ഒരു ആഗേയ ശിലയുടെ ടെക്സ്ചറിൽ നിന്നും അത് തണുത്തുറയുന്ന ചരിത്രം മനസ്സിലാക്കുന്നതെങ്ങനെയാണ്? (2)

4. സാമ്പത്തിക പ്രാധാന്യമുള്ള ധാതുനിക്ഷേപങ്ങളുടെ രൂപീകരണം സംബന്ധിച്ച് താഴെ കൊടുത്തിട്ടുള്ള പട്ടിക പൂർണ്ണമാക്കുക. (4)

ധാതുരൂപീകരണ പ്രക്രിയ	ധാതുനിക്ഷേപത്തിന്റെ ഉദാഹരണങ്ങൾ
റെസിജ്വൽ കോൺസൺട്രേഷൻ	ബോക്സൈറ്റ്
ബീച്ച് പ്ലേസറുകൾ	---(എ)---
---(ബി)---	ബാൻഡഡ് അയേൺ ഫോർമേഷൻ
---(സി)---	സൗത്ത് ആഫ്രിക്കയിലെ വജ്ര നിക്ഷേപങ്ങൾ
മെറ്റമോർഫിക് നിക്ഷേപങ്ങൾ	--- (ഡി) ---

5.എ. ഇന്ത്യയിലെ പ്രധാന നഗരങ്ങൾ എല്ലാം തന്നെ പ്രളയഭീഷണയുള്ളവയാണ്. ഈ സാഹചര്യം കൈകാര്യം ചെയ്യുന്നതിനുള്ള ഏതെങ്കിലും രണ്ട് മാർഗ്ഗങ്ങൾ നിർദ്ദേശിക്കുക.

OR

B. If you live near an active volcano, what precautions do you take to save your life and property? (2)

6. a) Faults are fractures in rocks along which movement has occurred. In what respect the motion of hanging wall in a normal fault and reverse fault differs from each other? (2)

b) Which type of fault is bounded on either side of a horst or graben? Illustrate with the help of a diagram. (2)

7. Explain any three types of folds with the help of suitable diagrams. (3)

8. Differentiate between a hazard and a disaster with examples. (2)

9. a). The principle of ----- can be said as 'the present is key to the past'

- i) Uniformitarianism
- ii) Superposition
- iii) Original horizontality
- iv) Faunal succession

(1)

b). How does the principle of faunal succession allow us to determine the relative age of geologic events? (2)

10. A. Suppose, a mechanized charnockite quarry starts functioning nearby your village. Evaluate the possible impacts of the quarrying activity on the environment.

OR

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ബി. സജീവമായ ഒരു അഗ്നിപർവ്വതത്തിന്റെ സമീപത്താണ് നിങ്ങൾ താമസിക്കുന്നത് എന്ന് കരുതുക. നിങ്ങളുടെ ജീവനും സ്വത്തിനും സംരക്ഷണം ലഭിക്കുന്നതിനായി എന്ത് മുൻകരുതലുകളാണ് നിങ്ങൾ കൈക്കൊണ്ടിട്ടുണ്ടാവുക? (2)

6.(എ)സ്ഥാനാന്തരണത്തോട് കൂടിയ വിള്ളലുകളാണ് ഭ്രംശനം (ഫോൾട്ടുകൾ). നോർമൽ ഫോൾട്ടിലും റിവേഴ്സ് ഫോൾട്ടിലും ഹാങ്ങിംഗ് വാളിന്റെ സ്ഥാനഭ്രംശം തമ്മിലുള്ള വ്യത്യാസമെന്താണ് ? (2)

(ബി)ഹോഴ്സ്റ്റ് അല്ലെങ്കിൽ ഗ്രാബൻ ഫോൾട്ടിന്റെ വശങ്ങളിൽ ഏത് തരം ഫോൾട്ടാണ് ഉണ്ടാവുക? ഒരു ചിത്രത്തിന്റെ സഹായത്തോടെ വ്യക്തമാക്കുക. (2)

7. അനുയോജ്യമായ ചിത്രങ്ങളുടെ സഹായത്തോടെ എതെങ്കിലും മൂന്ന് തരം ഫോൾഡുകളെ കുറിച്ച് വിവരിക്കുക. (3)

8. 'ഹസാർഡ്', 'ഡിസാസ്റ്റർ' എന്നിവ തമ്മിലുള്ള വ്യത്യാസം ഉദാഹരണ സഹിതം എഴുതുക. (2)

9. (എ) 'വർത്തമാനകാലം ഭൂതകാലത്തിന്റെ താക്കോലാണ്' എന്നത് ----- തത്വത്തെ കുറിച്ച് പറയുന്നതാണ്. (1)

- i) യൂണിഫോമിറ്റേറിയാനിസം
- ii) സൂപ്പർ പൊസിഷൻ
- iii) ഒറിജിനൽ ഹൊറിസോണ്ടാലിറ്റി
- iv) ഫോണൽ സക്സഷൻ

(ബി) ജിയോളജിക്കലായ സംഭവ വികാസങ്ങളുടെ ആപേക്ഷിക കാലഗണന നടത്തുന്നതിന് 'ഫോണൽ സക്സഷൻ തത്വം' സഹായിക്കുന്നതെങ്ങനെയാണ് ? (2)

10. എ. ഒരു യന്ത്രവൽകൃത കരിങ്കൽ ക്വാറി നിങ്ങളുടെ അടുത്ത ഗ്രാമത്തിൽ പ്രവർത്തനം തുടങ്ങാൻ പോകുന്നുവെന്ന് കരുതുക. ഖനനം മൂലം അവിടുത്തെ പരിസ്ഥിതിക്ക് ഉണ്ടായേക്കാവുന്ന പ്രത്യാഘാതങ്ങൾ വിലയിരുത്തുക.

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B. In what ways are sand mining harmful to the environment? What steps could be taken to reduce the problems? (3)

11. Match the column A with B and C. The table shows the interrelationship between plate boundaries and zone of earthquakes. (3)

A	B	C
Diverging boundaries	Horizontal slide past movement	Oceanic ridges
Converging boundaries	Tensional stress	San Andreas Fault
Transform fault boundaries	Compressional stress	Subduction boundaries

12. a). An earthquake magnitude of 6.5 has - ----- energy than a quake of magnitude 5.5

- i) about 10 times
- ii) twice as much
- iii) 31 times more
- iv) more than three times (1)

b). How is the intensity of an earthquake determined? (2)

c). Outline the factors that cause the intensity and impact of an earthquake to vary from place to place. (2)

13. Resources like petroleum, iron ore etc. cannot be produced as fast as they are consumed. Do you think that there is a need for conservation of such non-renewable resources? Suggest any two measures with examples to conserve mineral resources. (2)

ബി. മണൽ ഖനനം ഏതെല്ലാം തരത്തിലാണ് പരിസ്ഥിതിക്ക് ദോഷമാകുന്നത് ? ഈ പ്രശ്നത്തിന്റെ രൂക്ഷത കുറയ്ക്കാൻ എന്തെല്ലാം നടപടികൾ സ്വീകരിക്കാം ?

(3)

11. ചേരുപടി ചേർക്കുക. ഫലകാതിരുകളും ഭൂകമ്പമേഖലകളും തമ്മിലുള്ള ബന്ധം സൂചിപ്പിക്കുന്ന പട്ടികയാണ് തന്നിട്ടുള്ളത്. (3)

എ	ബി	സി
വിയോജന സീമ	തിരശ്ചീനമായ തെന്നി നീങ്ങൽ	ഓഷ്യാനിക് റിഡ്ജസ്
സംയോജന സീമ	ടെൻഷണൽ സ്റ്റെസ്സ്	സാൻ ആൻഡ്രിയാസ് ഫോൾട്ട്
ചേരദക സീമ	കംപ്രഷണൽ സ്റ്റെസ്സ്	സബ്ഡക്ഷൻ അതിരുകൾ

12.(എ) വ്യാപ്തി (magnitude) 6.5 ഉള്ള ഒരു ഭൂകമ്പത്തിന് 5.5 വ്യാപ്തിയുള്ള ഒരു ഭൂകമ്പത്തിനേക്കാൾ ----- ഊർജ്ജം കൂടുതൽ പുറത്ത് വരുന്നതാണ്.

- i) ഏകദേശം 10 മടങ്ങ്
- iii) ഇരട്ടിയോളം
- iv) 31 ഇരട്ടിയോളം കൂടുതൽ
- iv) മൂന്നിരട്ടിയിലും കൂടുതൽ (1)

(ബി)ഭൂകമ്പത്തിന്റെ തീവ്രത നിശ്ചയിക്കുന്നതെങ്ങനെയാണ് ? (2)

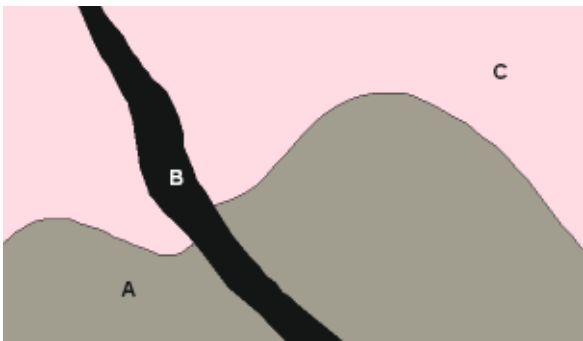
(സി)ഭൂകമ്പത്തിന്റെ തീവ്രതയും ആഘാതവും പ്രദേശങ്ങൾക്കനുസരിച്ച് വ്യത്യാസപ്പെടുന്നതിന് പിന്നിലുള്ള ഘടകങ്ങൾ സൂചിപ്പിക്കുക. (2)

13. പെട്രോളിയം, ഇരുമ്പയിർ തുടങ്ങിയ വിഭവങ്ങൾ ഉപയോഗിക്കുന്നതിനനുസരിച്ച് ഉണ്ടായിക്കൊണ്ടിരിക്കുന്നില്ല. ഇത്തരം പുനരുദ്ധരിക്കാനാവാത്ത വിഭവങ്ങൾ പരിരക്ഷിക്കപ്പെടേണ്ടതുണ്ടെന്ന് താങ്കൾ കരുതുന്നുണ്ടോ? ധാതുവിഭവങ്ങൾ പരിരക്ഷിക്കുവാനായി സ്വീകരിക്കാവുന്ന ഏതെങ്കിലും രണ്ട് രീതികൾ ഉദാഹരണസഹിതം നിർദ്ദേശിക്കുക. (2)

14. The term pluton is applied for an igneous intrusion formed at deep or shallow depth.

- a). What is the largest of all plutons? (1)
- b). Is it concordant or discordant? Illustrate with the help of a diagram. (2)

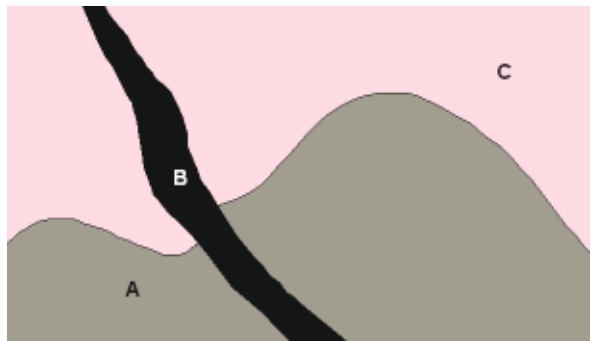
15. Analyse the figure given below. Make use of the principles of stratigraphy and arrange the sequences of events in their correct order, starting with the oldest event first. Consider also the intrusion shown in the diagram. (3)



14. ഭൂമിക്കടിയിൽ ഉണ്ടാകുന്ന ആഗേയ ശിലാരൂപങ്ങൾക്കാണ് പ്ലൂട്ടോൺ എന്ന് പറയുന്നത്.

- (എ) പ്ലൂട്ടോണുകളിൽ ഏറ്റവും വലുത് ഏതാണ്? (1)
- (ബി) ഇത് കൺകോർഡന്റോ ഡിസ്കോർഡന്റോ? ചിത്ര സഹിതം സമർത്ഥിക്കുക. (2)

15. താഴെ കൊടുത്തിട്ടുള്ള ചിത്രം പരിശോധിക്കുക. സ്ട്രാറ്റിഗ്രാഫിയുടെ തത്വങ്ങൾ ഉപയോഗിച്ച്, ഏറ്റവും ആദ്യമുണ്ടായത് ഒന്നാമതെന്ന വിധത്തിൽ ഓരോ സംഭവങ്ങളും ശരിയായ ക്രമത്തിലാക്കുക. ചിത്രത്തിൽ കാണിച്ചിട്ടുള്ള ഇൻട്രൂഷനും പരിഗണിക്കുക. (3)



16. A. To what extent is it possible to manage the hazards related to coastal erosion? Suggest any three strategies to minimize the impacts of this problem.

OR

B. Describe the causes and impacts of landslides? (4)

17. How are sandstone and quartzite different? In what way are they similar? Explain your ideas giving the texture and mineralogy of both the rocks. (4)

18. We know that groundwater pollution is one of the major environmental issues we are facing today. Discuss the major sources of groundwater pollution and mention the effect of such pollutants to human health and environment. (4)

16. എ. കടൽക്ഷോഭവുമായി ബന്ധപ്പെട്ട ദുരന്തങ്ങൾ ഏത് അളവ് വരെ നിയന്ത്രിക്കുവാനാകും? ഈ പ്രശ്നം ലഘൂകരിക്കുവാനുള്ള ഏതെങ്കിലും മൂന്ന് മാർഗ്ഗങ്ങൾ നിർദ്ദേശിക്കുക.

അല്ലെങ്കിൽ

ബി. ഉരുൾപൊട്ടലിന്റെ കാരണങ്ങളും പ്രത്യാഘാതങ്ങളും വിവരിക്കുക. (4)

17. സാൻഡ്സ്റ്റോണും, ക്വാർട്ട്സൈറ്റും തമ്മിൽ എന്തെല്ലാം വ്യത്യാസങ്ങൾ ഉണ്ട്? ഇവ തമ്മിലുള്ള സമാനതകൾ എന്തെല്ലാമാണ്? ഈ രണ്ട് ശിലകളുടെയും ടെക്സ്ചറുകൾ, ധാതു ഘടകങ്ങൾ എന്നിവ സംബന്ധിച്ച താങ്കളുടെ ആശയം വിശദീകരിക്കുക. (4)

18. ഇന്ന് അനുഭവപ്പെടുന്ന പാരിസ്ഥിതികപ്രശ്നങ്ങളിൽ പ്രധാനപ്പെട്ടതാണ് ഭൂഗർഭജല മലിനീകരണം എന്ന് നമുക്കറിയാം. ഭൂഗർഭജല മാലിന്യങ്ങളുടെ സ്രോതസ്സുകളും അത്തരം മാലിന്യങ്ങൾ ആരോഗ്യത്തിനും പരിസ്ഥിതിക്കും ഉണ്ടാക്കുന്ന പ്രത്യാഘാതങ്ങളും വിവരിക്കുക. (4)

## Answer Key

Qn. No.	Value points	Score	Total
1.	a i). Coal	1	6
1.	b Peat, lignite, bituminous and anthracite. Lowest grade-peat; highest grade-anthracite	1 1	
1.	c Fossil fuels are non renewable, uncontrolled consumption produces much CO <sub>2</sub> and cause global warming. Use alternative renewable energy sources, reduce consumption and develop substitutes.	3	
2.	a Gangue	1	3
2.	b Syngenetic-mineral deposits formed contemporaneous with enclosing rock. Epigenetic- mineral deposits formed later than enclosing rock.	1 1	
3	A. Intrusive rocks -large crystals because of slow cooling of magma at depth. Extrusive rocks-small crystals/glassy matter because of rapid cooling of lava at surface. Pegmatites are formed at later stages of crystallisation, temperature and viscosity of magma will be very low, gets enough time to crystallise. B. Coarse grained, equigranular and holocrystalline textures result from slow cooling of magma. Holohyaline and fine grained texture of rocks indicate rapid cooling of molten rock material.	1  1  2	2
4.a	Ilmenite, rutile, monazite	1	4
4.b	Sedimentary/chemical sedimentary process	1	
4.c	Magmatic disseminations	1	
4.d	Magnetite, asbestos	1	
5	A. Engineering approaches- Channel modification, construction of dams, levees, retention ponds, etc. (any two)	1+1	2
	B. Response to warning based on eruption forecasts, evacuation, designing roofs with steep slopes, clearing tephra from roofs, etc. (any two)	1+1	
6.a	Normal-hanging wall moved down relative to footwall. Reverse- hanging wall moved up relative to footwall.	1+1	4
6.b	Horsts are up thrown blocks bounded either sides by non parallel normal faults and grabens are downthrown blocks bounded either sides by non parallel normal faults +neat diagram	2	

Qn. No.	Value points	Score	Total
7	Explanation and figures /diagrams of any three types folds	1+1+1	3
8	Hazard- a situation that poses a level of threat to life, health or environmental damage. Example:- an earthquake in desert Disaster- serious disruption in the functioning of the community causing widespread losses which exceed the ability of the affected society to cope using its own resources. Example:- A destructive earthquake in a densely populated area	2	2
9.a	i) Uniformitarianism	1	3
9.b	Fossils occur in a definite chronological order. Rocks of the same age contain the same, or very similar, fossil species, even when the rock units extend over a large area or the exposures are not continuous. A period or any portion of geologic time can be recognized by its respective fossils.	2	
10	A. Details of environmental impacts of mining on lithosphere, hydrosphere, atmosphere and biosphere (any three points)	3	3
	B. Impacts of sand mining such as depletion of water table, erosion of river banks, enlargement of coastal inlets etc. Sand mining may be allowed only based on the recommendations of scientific studies. Substitutes may be used for river sand.	3	
11	Diverging boundaries- Tensional stress- Oceanic ridges Converging boundaries- Compressional stress- Subduction boundaries Transform fault boundaries- Horizontal slide past movement- San Andreas Fault	1+1+1	3
12.a	iii) 31 times more	1	5
12.b	By assessing the damage it does and how much shaking is felt, evaluating the loss of life and properties, the intensity of earthquake can be determined. Mercalli scale defines the intensity of earthquakes. The scale is denoted by Roman numerals ranging from I to XII. The intensity scale is applied after the earthquake by conducting surveys of people's response to the intensity of ground shaking and destruction.	2	

<b>Qn. No.</b>	<b>Value points</b>	<b>Score</b>	<b>Total</b>
12.c	<p>Damage caused to structures from ground shaking depends on the type of construction. Concrete and masonry structures, because they are brittle, they are more susceptible to damage than wood and steel structures, which are more flexible.</p> <p>The type and extent of damage caused are related primarily to the strength of the ground motions as well as to the behaviour of the foundation.</p>	2	
13	<p>Strategies for conservation of mineral resources include recycling, reduction of waste, preventing abuse, substitution, etc.</p> <p>Renewable energy sources, such as solar, wind, hydroelectric, and geothermal, have to be utilized.</p>	2	2
14.a	Batholith	1	
14.b	Discordant + Diagram	1+1	3
15	<ol style="list-style-type: none"> <li>1. Formation of rock body-A</li> <li>2. Formation of rock body -C</li> <li>3. Intrusion of dyke-B</li> </ol>	1+1+1	3
16	<p>A. Hard stabilization techniques- Sea walls, groins, jetties, etc. (in detail)</p> <p>Soft stabilization techniques- Beach nourishment, dune building, vegetation etc. (in detail)</p>	2+2	
	<p>B. Causes- Torrential rainfall, human intervention in the form of removal of vegetation, slope modifications for construction of roads, buildings and settlements, Practicing of unscientific crop cultivation, etc.</p> <p>Effects- extensive loss of life and property, destruction of landscapes, loss of wild life habitat etc.</p>	2+2	4
17	<p>Sandstone is a sedimentary rock, composed almost entirely of sand-sized quartz grains (0.063 - 2 mm) cemented together through lithification.</p> <p>Sandstones that have been converted into a metamorphic rock are called quartzites. Since quartz is stable over a wide range of pressures and temperatures, quartzites are free from pores and have a smooth fracture.</p>	4	4



## WEIGHT TO CONTENT & LEARNING OUTCOMES

No.	Unit	LO No.	Weight	Percentage
1	The World of Rocks	1.2,1.3,1.6,1.8	9	15
2	Economic Mineral Deposits	2.1,2.2,2.4,2.6	7	12
3	Fossil Fuels	3.1,3.2,3.5	6	10
4	Geological Structures	4.4,4.5	7	12
5	History of the Earth	5.6	6	10
6	Geology and Environment	6.4,6.5,6.6,6.9	9	15
7	Earthquakes	7.2,7.6,7.7	8	13
8	Geological Hazards and Disaster Management	8.4,8.5, 8.6,8.7,8.8	8	13
	<b>Total</b>		<b>60</b>	<b>100</b>

## WEIGHT TO THINKING SKILLS

No.	Thinking Skills	Score	Percentage
1	For conceptual attainment	36	60
2	For conceptual generation	24	40
	<b>Total</b>	<b>60</b>	<b>100</b>

## WEIGHT TO FORM OF QUESTIONS

No.	Type	No. of Questions	Score	Percentage
1	Objective Type	12	12	20
2	Short answer	16	36	60
3	Essay	3	12	20
	<b>Total</b>	<b>31</b>	<b>60</b>	<b>100</b>

**Class : XII**  
**Subject : Geology**

**BLUE PRINT**

**Score : 60**  
**Time : 2 Hrs**

Unit	Thinking skills Content	Thinking skills for Conceptual Attainment			Thinking skills for Conceptual Generation			Total
		OB	SA	Essay	OB	SA	Essay	
1	The World of Rocks	1(1)	2(1)			2(1)c	4(1)	9
2	Economic Mineral Deposits	1(5)	2(1)					7
3	Fossil Fuels	1(1)	2(1)			3(1)		6
4	Geological Structures		3(1)			2(1), 2(1)		7
5	History of the Earth	1(1)	2(1)			3(1)		6
6	Geology and Environment		3(1)c	4(1)		2(1)		9
7	Earthquakes		2(2)		1(4)			8
8	Geological Hazards and Disaster Management		2(1)c	4(1)c		2(1)		8
	<b>Total</b>	<b>1(8)</b>	<b>2(6) 3(2)</b>	<b>4(2)</b>	<b>1(4)</b>	<b>2(5) 3(2)</b>	<b>4(1)</b>	<b>60</b>



## QUESTION BASED ANALYSIS

Sl. No.	Content/Units	LO	Specific thinking Skills	Form of Questions	Score	Time in minutes
1.a	III	3.1	1.2 Recalling	Obj	1	1
1.b	III	3.2	2.3 Classifying	Short	2	3
1.c	III	3.5	4.3 Attributing	Short	3	6
2.a	II	2.1	1.1 Recognising	Obj	1	1
2.b	II	2.2	2.6 Comparing	Short	2	3
3	I	1.3	6.1 Generating	Short	2	5
4.a	II	2.5	2.2 Exemplifying	Obj	1	1
4.b	II	2.4	2.2 Exemplifying	Obj	1	1
4.c	II	2.2	2.2 Exemplifying	Obj	1	1
4.d	II	2.6	2.2 Exemplifying	Obj	1	1
5	VIII	8.6/8.5	3.2 Implementing	Short	2	3
6.a	IV	4.4	5.1 Checking	Short	2	4
6.b	IV	4.5	5.2 Critiquing	Short	2	5
7	IV	4.4,4.5	2.7 Explaining	Short	3	5
8	VIII	8.1	4.1 Differentiating	Short	2	5
9.a	V	5.6	1.1 Recalling	Obj	1	1
9.b	V	5.6	5.2 Critiquing	Short	2	5
10	VI	6.4/6.5	2.5 Inferring	Short	3	5
11	VII	7.2	4.2 Organizing	Obj	1	2
11	VII	7.2	4.2 Organizing	Obj	1	2
11	VII	7.2	4.2 Organizing	Obj	1	2
12.a	VII	7.6	3.1 Executing	Obj	1	1
12.b	VII	7.6	2.4 Summarising	Short	2	3
12.c	VII	7.7	2.5 Inferring	Short	2	3
13	VI	6.9	4.3 Attributing	Short	2	5
14.a	I	1.2	1.2 Recalling	Obj	1	1
14.b	I	1.2	2.6 Comparing	Short	2	3
15	V	5.6	5.1 Checking	Short	3	7
16	VIII	8.8/8.7	2.7 Explaining	Essay	4	10
17	I	1.6,1.8	4.1 Differentiating	Essay	4	12
18	VI	6.6	3.2 Implementing	Essay	4	10