

# ANSWER KEY

SECOND YEAR HIGHER SECONDARY EXAMINATION .. MARCH .... 2025

PART-I/II/III

SUBJECT: ... GEOLOGY .....

CODE NO: SA.429

VERSION: R...

GD... SCORES

..... HOURS

| Qn. No  | Sub Qns | Answer Key/Value Points                                                                                                              | Score | Total Score |
|---------|---------|--------------------------------------------------------------------------------------------------------------------------------------|-------|-------------|
| 1       |         | Dunite                                                                                                                               | 1     |             |
| 2.      |         | Anthracite                                                                                                                           | 1     |             |
| 3.      |         | Limb                                                                                                                                 | 1     |             |
| 4.      |         | Carbonization                                                                                                                        | 1     |             |
| 5.      |         | Ground Water                                                                                                                         | 1     | 5           |
| [5x1=5] |         |                                                                                                                                      |       |             |
| 6 a.    |         | Salt water Intrusion                                                                                                                 | 1     |             |
| 6.      |         | ① Relocate wells ② Reduce pumping or time share pumping / Any relevant answer.                                                       | 1     | 2           |
| 7 a.    |         | Elastic deformation                                                                                                                  | 1     |             |
| 6.      |         | Thrust fault.                                                                                                                        | 1     | 2           |
| 8.      |         | 1) Growth in place 2) Drift theory                                                                                                   |       | 2           |
| 9       |         | An ore is a body of material from which one or more valuable metals can be extracted economically Eg: Al - bauxite                   | 1     |             |
|         |         | The worthless non-metallic minerals which occurs in close association with ore minerals. Eg: Quartz, feldspar, calcite and dolomite. | 1     | 2           |

| Qn. No | Sub Qns | Answer Key/Value Points                                                                                                                                                                                                                                                                                                                               | Score      | Total Score |
|--------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------|
| 10     | a       | Rock where the organic matter is converted into oil by burial and post depositional changes.                                                                                                                                                                                                                                                          | 1          | 2           |
|        | b.      | The movement of petroleum from the source rock to a reservoir rock is termed migration.                                                                                                                                                                                                                                                               | 1          |             |
| 11.    | a       | Anthracite                                                                                                                                                                                                                                                                                                                                            | 1          | 2           |
|        | b.      | Focus.                                                                                                                                                                                                                                                                                                                                                | 1          |             |
| 12.    | 1)      | Heat: Several sources of heat contribution for metamorphism 1) Geothermal 2) Radio active decay 3) heat supplied by intrusions of hot magma / Any relevant answer from text.                                                                                                                                                                          | 1          | 2           |
|        | 2)      | Pressure: Lithostatic Pressure 2) Directed pressure / Relevant answer from the text.                                                                                                                                                                                                                                                                  | 1          |             |
|        |         |                                                                                                                                                                                                                                                                                                                                                       | [6x2 = 12] |             |
| 13.    |         | Igneous rocks can be weathered and broken down to form sediments → lithified to form sedimentary rocks → deeply buried and subjected to heat and pressure, time and converts to form metamorphic rocks. Metamorphic rocks may be heated to temperatures to form molten melt → crystallise to form igneous rocks → cyclic process completes / Relevant | 3          | 3           |
|        |         | Fig: from text.                                                                                                                                                                                                                                                                                                                                       |            |             |

| Cn. No | Sub Qns | Answer Key/Value Points                                                                                                                                                                                                                                                                                                                                                        | Score | Total Score |
|--------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------|
| 14     | a       | Monazite / Ilmenite / Rutile                                                                                                                                                                                                                                                                                                                                                   | 1     | 3           |
|        | b.      | Wollastonite or Palaeoclod c) clay                                                                                                                                                                                                                                                                                                                                             | 1     |             |
| 15     |         | Principle of Uniformitarianism: states that geological process and natural process and natural laws that are now operating on Earth have acted in the same way regular way manner and with essentially the same rate throughout the geologic time. And that the past geologic time can be explained by the phenomena and forces observable today. / Relevant answer from text. | 3     | 3           |
| 16     | a       | Establishing geologic time, correlation of rock sequence / relevant answer                                                                                                                                                                                                                                                                                                     | 1     |             |
|        | b.      | Absolute dating: specifying the actual no of years that have passed since an event occurred. Relative dating - tell scientists if a rock layer is older or younger than one another. It involves placing rocks and events in their proper sequence.                                                                                                                            | 2     | 3           |
| 17     | a       | P waves - compressional waves - in which the motion of particles takes place parallel to the direction of propagation - Fastest waves arrives first at a seismological station. S - waves - Shear waves - arrives second - in which displacement is perpendicular to the direction of propagation. It cannot propagate in fluids. / Relevant data.                             | 2     | 3           |
|        | b.      | Modification of geological features, Ground rupture, / Five / Relevant answer from text.                                                                                                                                                                                                                                                                                       | 1     |             |

| Qn. No | Sub Qns | Answer Key/Value Points                                                                                                                                                                                                                                                                                                                                                                                                                | Score        | Total Score |
|--------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------|
| 18.    |         | Refers to outflow of acidic water from coal mines. Metal sulphides are exposed during mining activities. When large quantities of rock containing sulphide minerals are excavated from open pits; it reacts with water and oxygen to create sulphuric acid. When the water reaches a certain level of acidity, a bacteria, <i>Thiobacillus</i> may kick in, accelerating the oxidation and acidification process.<br>/ relevant points | 3            | 3           |
|        |         |                                                                                                                                                                                                                                                                                                                                                                                                                                        | [5 x 3 = 15] |             |
| 19.    | a       | Renewable Resources are <sup>generally</sup> living, which can resources which can restock themselves if they are over harvested Eg: Fish, water, animals, forests.<br>Non renewable: which cannot be replaced after their use. Eg: Minerals, Fossil fuels.                                                                                                                                                                            | 2            |             |
|        | b.      | Conservation means careful use: Recycling is the method of collecting and processing of used items so that they can be made into new items. Eg: Scraps produced during production can be collected and reused.<br>Substitution another method. Thus we can prevent excessive use of natural resources and conserve them / Relevant points                                                                                              | 2            |             |
| 20.    | 1.      | Felsic: Rich in Silica & Oxygen, low melting point, light colour, quartz and feldspar. Silica content: 76.3%. Eg: Granite                                                                                                                                                                                                                                                                                                              | 1            |             |
|        | 2.      | Intermediate: light and dark coloured minerals, Silica - 52-63%                                                                                                                                                                                                                                                                                                                                                                        | 1            |             |
|        | 3.      | Mafic: low in silica 45-52%, dark colour, high melting, Mg & iron, minerals: olivine & pyroxene<br>& Eg: Gabbro.                                                                                                                                                                                                                                                                                                                       | 1            |             |
|        |         |                                                                                                                                                                                                                                                                                                                                                                                                                                        |              | 4           |

| Qn. No | Sub Qns | Answer Key/Value Points                                                                                                                                                                                                                                                                                                                                                                                                                 | Score | Total Score |
|--------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------|
| 4.     | *       | 4. Ultramafic: more rich in iron and mg. Silica $\approx 45\%$ . Eg: dunite. / Relevant points.                                                                                                                                                                                                                                                                                                                                         | 1     | 4           |
| 21.    | a       | Hazard: a dangerous phenomenon that may cause loss of life, injury, loss of livelihoods. A disaster can be defined as a serious disruption <del>of</del> in the functioning of the community causing widespread material social or environmental loss which exceed the ability of the <del>soci</del> society to cope using its own resources. / Relevant answer.                                                                       | 3     |             |
|        | b.      | Preparation, Response, Recovery, Mitigation                                                                                                                                                                                                                                                                                                                                                                                             | 1     | 4           |
| 22.    | a.      | Elastic Rebound Theory.                                                                                                                                                                                                                                                                                                                                                                                                                 | 1     |             |
|        | b.      | Rock masses behave as elastic materials under operating stress. When the rocks are stressed, they respond initially by elastic deformation and then by plastic and rupture occurs, accompanied by displacement of the rock blocks. If slippage along a fault is hindered then elastic strain energy buildup in the deforming rocks on either side of the fault. When the slippage does occur, the energy released causes an Earthquake. | 3     | 4           |
| 23.    | a.      | Mineral deposits formed as a result of gravity separation based on density.                                                                                                                                                                                                                                                                                                                                                             | 2     |             |
|        | b.      | The beach placer deposits along shore of Chavara, Kollam - heavy minerals such as ilmenite, rutile, zircon, garnet, monazite. / Relevant answer.                                                                                                                                                                                                                                                                                        | 2     | 4           |

| Qn. No | Sub Qns             | Answer Key/Value Points                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Score             | Total Score |
|--------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------|
| 24.    | <p>a.</p> <p>b.</p> | <p>Rain fall during monsoon, human activities in the form of removal of vegetation, slope modification, construction, roads, and settlements, crop cultivation / Relevant points.</p> <p>Proper land use practices, Forestation, detailed geotechnical studies, making mandatory the total avoidance of settlement in risk zone, no construction, Some of the engineering techniques to make the slope more stable are:</p> <ol style="list-style-type: none"> <li>1) steep slopes covered with wire mesh</li> <li>2) Rock bolts may be used</li> <li>3) Drainage pipes could be used</li> <li>4) Graded or terraced</li> <li>5) Construction of buttress.</li> </ol> <p>/ Relevant points</p> | <p>2</p> <p>4</p> | <p>6</p>    |
| 25.    | <p>a.</p> <p>b.</p> | <p>Preservation of unaltered hard parts: The bones and teeth may survive in rocks.</p> <p>Trace fossils: are markings in the sediment made by the activities of organisms. These traces of organisms are result from the movement of organisms or tunneling of the organisms. It includes trails, burrows, foot prints etc. / any other methods.</p> <p>An organism must have hard parts;</p> <ul style="list-style-type: none"> <li>* must rapidly buried under sediments.</li> <li>* must be escaped from physical, chemical and biological destruction after burial / Relevant points.</li> </ul>                                                                                           | <p>4</p> <p>2</p> | <p>6</p>    |

| Cn. No | Sub Qns | Answer Key/Value Points                                                                                                                                                                                                                                                                                                                                                                                                                          | Score | Total Score |
|--------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------|
| 26     | a.      | <p>Elastic: in which temporary changes in shape or size of the rocks occurs. The deformed object resumes its original shape and size when the deforming force is removed. Fracture: As the applied force is increased, a material undergoes no further changes and it suddenly breaks. <u>Excessive strain</u>.</p>                                                                                                                              | 2     |             |
|        | b.      | <p><u>Disconformity</u>: an erosion surfaces occurring between two sets of sedimentary layers. But in these, the lower sets of sedimentary layers are not filled/prior to deposition of the upper set of sedimentary layers. <u>Angular unconformity</u>: is a contact that separates a younger set of rock units. It is a type in which the beds below the unconformity dip at a different angle than the beds above it. / Relevant points.</p> | 2     |             |
|        | c.      | <p><u>Normal Fault</u>: A fault in which the hanging wall appears to have moved <sup>downward</sup> <del>upward</del> relative to the foot wall.</p> <p><u>Reverse Fault</u>: A fault in which the hanging wall moved upward relative to the foot wall.</p>                                                                                                                                                                                      | 2     | 6           |