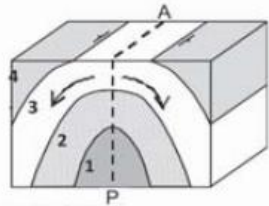
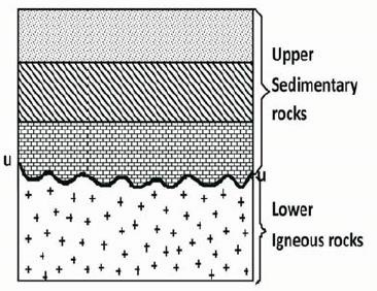
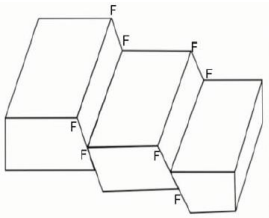





PU 2 GEOLOGY

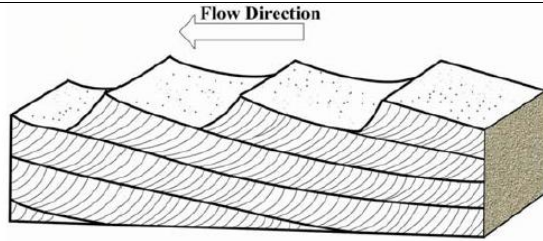
Scheme of Evaluation - 2022

| Question no. | Answer | Marks |
|--------------|---|-------|
| 1. | Igneous, Sedimentary, Metamorphic | 1 |
| 2. | Forms at great depth/Granite | 1 |
| 3. | Cut across the pre-existing rocks/Dyke | 1 |
| 4. | Sediments derived after weathering, transportation and deposition are consolidated by a process called lithification. | 1 |
| 5. | Limestone/Dolomite | 1 |
| 6. | Undulation or waves or bend in rocks | 1 |
| 7. | Fault in which two series of step fault appear to coverage downwards and the central block is lowered down compared to the lateral blocks forming a depression/ labeled diagram | 1 |
| 8. | Period divided in to epoch/ Smallest unit of Period | 1 |
| 9. | Undisturbed strata/bed where older beds are overlain by younger beds | 1 |
| 10. | Molds are filled up with subsequent by mineral matter called as cast | 1 |
| 11. | It is break like projection on shells of brachiopod/ terebratula | 1 |
| 12. | Each coiled or chamber of a spire is termed as whorl | 1 |
| 13. | When preexisting rocks changes in texture, structure or chemical composition by agents like pressure temperature and chemically active fluid | 2 |
| 14. | Cooling and consolidation of magma | 2 |
| 15. | Many animal during their activities over soft mud and sandy bottom leaves impressions of their moments such as tracks and trails | 2 |
| 16. | It is zone where temperature and pressure is moderate 300-550 degree Celsius. | 2 |
| 17. | Syncline: It is the fold which is concave upwards which opens upwards and both limbs dip towards the axial plane./It is a fold in which younger rocks are always found at the center of the curvature. It may be symmetrical or asymmetrical | 2 |
| 18. | Axial plane: The imaginary plane which divides the fold symmetrically into two equal halves is called an axial plane. or <div style="text-align: center;">  <p>AP = axial plane; 1 = Older bed; 4 = Younger bed</p> </div> | 2 |

| | | |
|-----|---|---|
| 19. | Geochronologic Units : Eon , Era, Period, Epoch, Age | 2 |
| 20. | The organism undergoes decomposition, losing oxygen and nitrogen with relative increase in carbon. | 2 |
| 21. | Composition of magma: It is a mixture of molten viscous silicates, dissolved gases and large amount of water. Elements like oxygen, silicon, aluminum, iron, calcium, sodium, potassium, magnesium, together constitute 99% of magma. Titanium and volatile matter makes 100% | 3 |
| 22. | The rocks formed under eruptive condition on the surface of the earth that are formed by rapid cooling with fine grained or glassy nature. Ex: Rhyolite, Andesite, Basalt, Pumice etc. | 3 |
| 23. | These include all those sedimentary rocks that have been formed from pre-existing rocks through the mechanical action of denuding agents. Ex: Sandstone, Conglomerate | 3 |
| 24. | It is the high temperature (550° C-1200° C) with great depth, where hydrostatic stress is quite dominant. Plutonic metamorphism is the representative type of high grade rocks Ex: granulite, eclogite. | 3 |
| 25. | <p>It is characterized by the deposition of younger rocks over the older igneous rock. The unconformity may be between volcanic and plutonic rocks or igneous or sedimentary rocks or igneous and metamorphic rocks. In general the older rocks are igneous. Hence, it is also called igneous unconformity.</p> <p>Or</p>  | 3 |
| 26. | <p>This is a fault in which there are more than one fault is present and they are arranged parallel to each other and all the faults having unique strike direction and down throw is symmetrically in same direction and appears to be step like structure, this is called step fault.</p> <p>Or</p>  | 3 |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------|--|----------|----------|-----------|---------------|-----------|----------|------------|--------------|--|--------------|------------|----------|----------|---------|---------------|----------|----------|------------|----------|--------------|---|--|--|--|--|--|--|--|--|---|
| 27. | <p>The significant contribution to principles of stratigraphy was made in 1785 by the Scottish lawyer James Hutton , who stressed the cyclic aspects (erosion, deposition and gradual uplift of crust) of the stratigraphic record. All the earth processes are responsible to bring about constant changes in the earth system. Hence, Hutton’s view was “the present is the key to the past” or present shall unlock the past history of the earth. When the present is properly understood, the past history of the earth can be traced and revealed.</p> | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28. | <p>Distribution: Corals are common in marine waters of calcareous beds (rare in arenaceous rocks) at shallow depth of every geologic period, since the beginning of the Palaeozoic. They have wide geographical distribution. They attained maximum development in middle Palaeozoic, and all through the Mesozoic till Recent.</p> <p>Or</p> <table border="1" data-bbox="375 709 1239 1045"> <tr> <td data-bbox="375 709 508 1045" rowspan="2">Cenozoic</td> <td colspan="3" data-bbox="508 709 708 768">Mesozoic</td> <td colspan="5" data-bbox="708 709 1105 768">Paleozoic</td> <td data-bbox="1105 709 1239 768">Pre cambrian</td> </tr> <tr> <td data-bbox="508 768 573 1045">Cretaceous</td> <td data-bbox="573 768 638 1045">Jurassic</td> <td data-bbox="638 768 708 1045">Triassic</td> <td data-bbox="708 768 773 1045">Permian</td> <td data-bbox="773 768 837 1045">Carboniferous</td> <td data-bbox="837 768 902 1045">Devonian</td> <td data-bbox="902 768 967 1045">Silurian</td> <td data-bbox="967 768 1032 1045">Ordovician</td> <td data-bbox="1032 768 1105 1045">Cambrian</td> </tr> <tr> <td data-bbox="375 932 435 1045">Coelenterata</td> <td colspan="9" data-bbox="435 932 1239 1045">  </td> </tr> </table> | Cenozoic | Mesozoic | | | Paleozoic | | | | | Pre cambrian | Cretaceous | Jurassic | Triassic | Permian | Carboniferous | Devonian | Silurian | Ordovician | Cambrian | Coelenterata |  | | | | | | | | | 3 |
| Cenozoic | Mesozoic | | | Paleozoic | | | | | Pre cambrian | | | | | | | | | | | | | | | | | | | | | | |
| | Cretaceous | Jurassic | Triassic | Permian | Carboniferous | Devonian | Silurian | Ordovician | Cambrian | | | | | | | | | | | | | | | | | | | | | | |
| Coelenterata |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29. | <p>Hypabyassal or intermediate: These are formed at intermediate depth with moderate cooling. These are medium grained. Ex: Dolerite, Microgranite, Pegmatite etc.</p> <p>Ex: Pegmatite: The rock is light coloured (felsic) with medium specific gravity. The important minerals are quartz, feldspar and mica. It exhibits intergrowth texture and occurs as veins.</p> | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30. | <p>a. Rudaceous: The rudaceous rocks consist chiefly of gravel, pebbles, cobbles or boulders having more than 2 mm size. Loose materials of this class are gravels, pebbles, shingle, boulder beds, scree, talus etc. e.g., conglomerate and breccia.</p> <p>b. Argillaceous: These rocks consist of the finest particles of rock, whose average grain size is less than 0.01 mm, consisting of dust and clay. e.g., Shale.</p> | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31. | <p>Economic Importance of Archean: Archean rocks contain a large variety of economic minerals. Many metallic and industrial minerals are associated with Archeans.</p> <ul style="list-style-type: none"> ▪ Gold: Only gold producing mine is situated in Hutti, Karnataka, which is associated with Dharwar rocks. | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| | <ul style="list-style-type: none"> ▪ Iron ore: Huge deposits of iron ore such as BIF, Magnetite and hematite occur within Archean rocks at Karnataka, Orissa, Bihar, Goa, Maharashtra and Madhya Pradesh. ▪ Manganese ore: M.P – Maharashtra zone, Bihar-Orissa zone, Karnataka-Goa zone has important reserves and quality. ▪ Other metallic ore deposits such as chromite, titanium are present in Karnataka, Tamil Nadu and Andhra Pradesh. ▪ Majority of Nonmetallic deposits such as mica, magnesite, marble, granite, slate occurs in southern part of India. ▪ Precious and semi-precious stones like Sapphire, Zircon, Tourmaline, Garnet, Emerald and Topaz are also associated with Archean rocks | |
| 32. | <p>a. Hinge: The line of maximum curvature of the fold or the line along which the amount and direction of dip changes is called hinge of a fold.</p> <p>b. Axis: The line of intersection of axial plane with the bedding plane is called fold axis or a line parallel to the hinge.</p> <p>c. Axial plane: The imaginary plane which divides the fold symmetrically into two equal halves is called an axial plane. It is the surface connecting all the hinges. It is also known as axial surface.</p> <p>d. Limbs : The two bends situated on the either side of the axis of a fold is called limbs. An individual fold consists of two limbs.</p> <p>e. Plunge of fold : The angle of inclination of a fold axis with reference to horizontal plane is called plunge of a fold.</p> <p>f. Crest of fold : The highest point of the fold is called crest. This term is used only in upfold.</p> <p>g. Trough of fold : It is the lowest part of the fold. The term is used only in downfold.</p> | 5 |
| 33. | <p>Granularity: It refers to the grain size of the crystals ranging in size from micro to large crystals present in igneous rocks.</p> <p>There are two kinds of grain sizes</p> <p>a. Phaneric : There are three categories of grain sizes- a) coarse, more than 5mm; b) medium, 1mm to 5mm; c) fine, less than 1mm.</p> <p>b. Aphanetic: when an individual grain cannot be identified by eyes. The grains are differentiated as- a) Microcrystalline, the individual crystals can be observed only under microscope. b) Cryptocrystalline, crystals cannot be observed under microscope because of its glassy nature. c) Glassy, no traces of crystals.</p> | |
| 34. | <p>Cross-stratification is a general term for the internal bedding structure produced in sand by moving wind or water. The cross bedding is formed by the ocean currents or by wind currents.</p> | 5 |



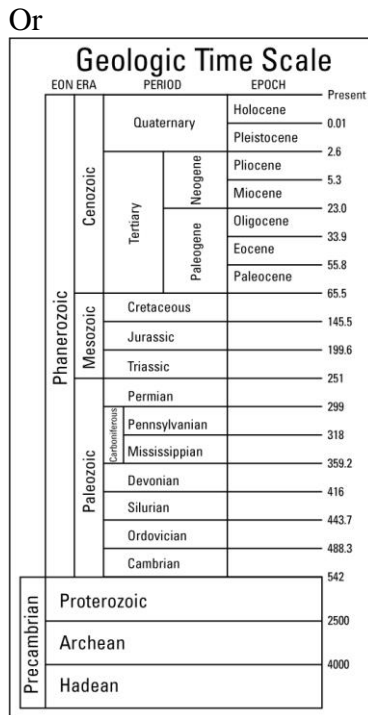
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1. Chronological/stratigraphic significance and value.
2. Determining paleo-climate and environment.
3. Evolution of life.
4. Purpose of correlation.
5. Economic importance such as coal and petroleum.

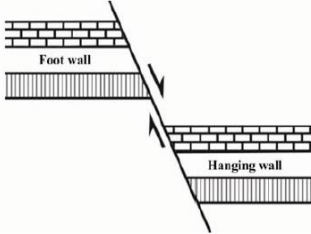
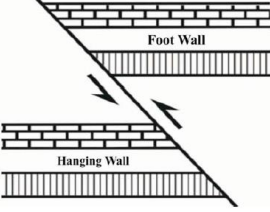
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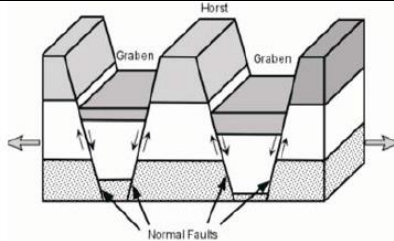
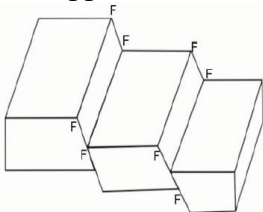
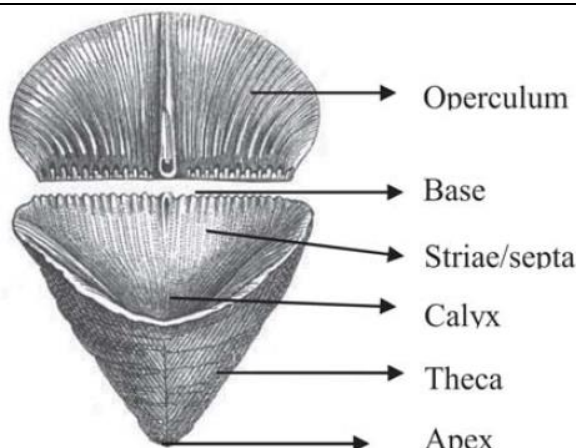
Geological Time scale

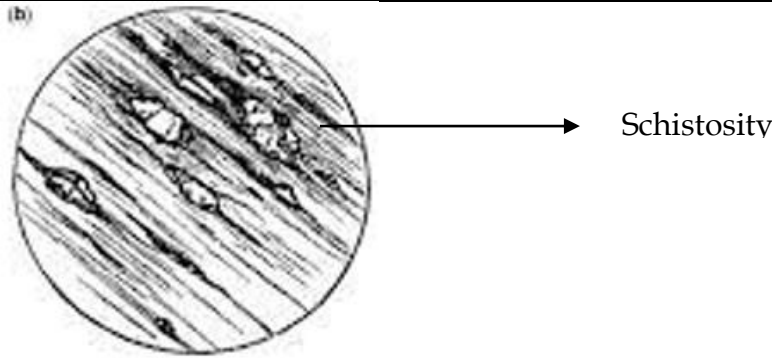
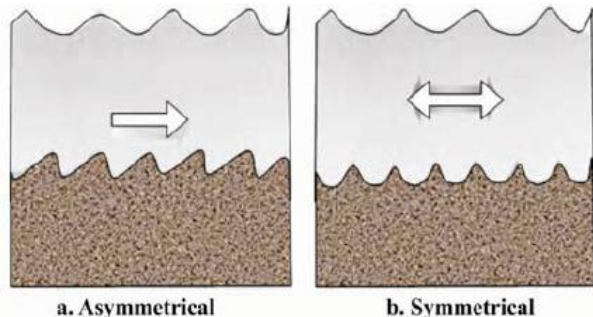
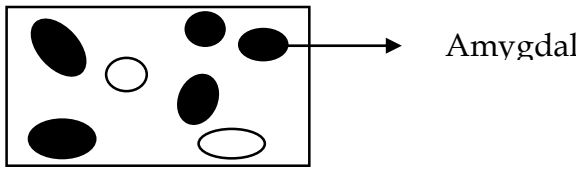
- Eon: Broadest divisions of geologic time.
 - Precambrian and Phanerozoic
- Era : Eons are further divided into eras.
 - Archean, Proterozoic, Paleozoic etc.
- Period : Eras are further divided into periods which signifies prominent activity or event
 - Paleozoic Era : Cambrian, Ordovician, Silurian, Devonian etc.
- Epoch: Periods are divided into epoch
 - Teriary Period: Paleocene, Eocene, Oligocene etc.
- Age: Epoch is further divided into age

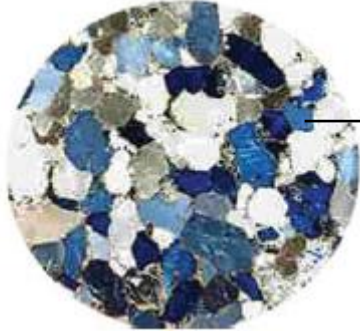
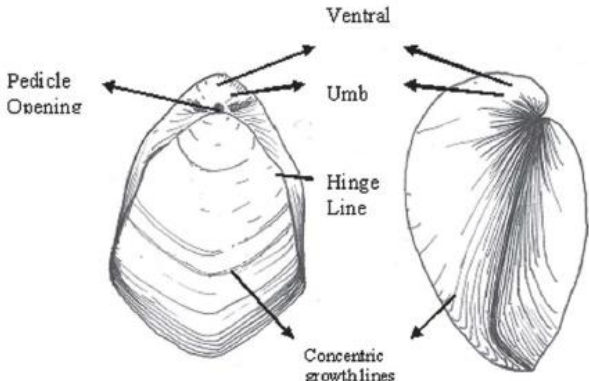


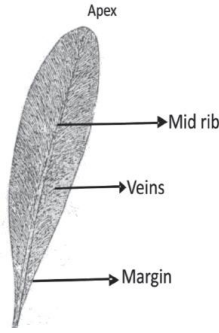
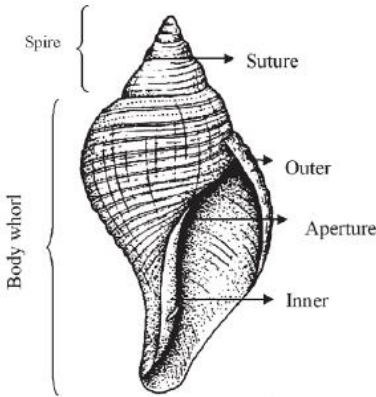
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| <p>37.</p> | <p>Temperature Temperature plays an important role in the process of metamorphism. Temperature accelerates the processes of reaction, increases the volume, removes volatiles and moisture contents of the pre-existing rocks. The temperature component is mainly by- geothermal gradients, magmatic heat, friction and radioactive disintegration.</p> <p>Pressure Metamorphic changes might be induced solely due to pressure. Pressure is resolved in to directed and uniform pressure. The uniform pressure, generated due to overlying weight of the rocks, leading to change in volume (compaction); and directed pressure is generated due to tectonic activities leading to change in shape or distortion.</p> <p>Chemically active fluids Chemically active fluids (liquids and gases) play a decisive role in the process of metamorphism. Water is the most important of all such liquids because it is a good solvent, which influences change resulting in the formation of new minerals.</p> | <p>5</p> |
| <p>38.</p> | <p>a. Normal fault: It is a fault along which the hanging wall is moved relatively downwards with respect to the foot wall.</p>  <p>b. Reverse fault: It is a fault along which the hanging wall is moved relatively upwards with respect to the foot wall.</p>  <p>c. Horst fault: It is a fault in which the two series of step faults appear to converge upwards and the central block raises upwards than the lower blocks on either side giving rise to horst structure.</p> <p>d. Graben fault: It is a fault in which the two series of step faults appear to converge downwards and the central block is lowered down compared to the lateral blocks thereby forming a depression. The centrally sunken block is called graben.</p> | <p>5</p> |

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| |  <p>e. Step fault: This is a fault in which there are more than one fault is present and they are arranged parallel to each other and all the faults having unique strike direction and down throw is symmetrically in same direction and appears to be step like structure, this is called step fault.</p>  | |
| 39. | <p>Mesozoic Era is an interval of geological time from about 252 to 60 million years ago. The era is subdivided into three major periods: the Triassic, Jurassic, and Cretaceous which are further subdivided into a number of epochs and stages. It is also called the Age of Reptiles, Ammonites and incoming of flowering plants.</p> <p>a. Flora: Conifers and flowering plants were the dominant terrestrial plants for most of the Mesozoic.</p> <p>b. Fauna: Dinosaurs were the dominant terrestrial vertebrates throughout much of the Mesozoic. The extinction of nearly all animal species at the end of the Permian Period.</p> | 5 |
| 40. |  | 5 |
| 41. | <p>The schistose structure is made up of broadly parallel or sub parallel layers or bands of flaky, platy or rod like minerals, making it very weak in the direction of parallelism. This structure is called schistose structure. Ex. Garnet Schist, Mica Schist.</p> | 5 |

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| 42. | a. | Sandstone is an arenaceous rock consisting mainly of sand grains generally between 0.1 to 2 mm size, with a siliceous cementing material. | 5 |
| | b. | Granite: These rocks are usually light colored (felsic) with medium specific gravity. The important minerals are quartz, feldspar and mica. It exhibits medium to coarse grained and hypidiomorphic texture (granitic). | |
| 43. | | <p>Ripple marks: These are undulations on the sediment surface produced as wind or water moves across the sand. Ripples are reflection of waves. Ripples are of two types, these are symmetrical and asymmetrical ripple marks.</p>  <p>a. Asymmetrical b. Symmetrical</p> | 5 |
| 44. | | <p>Amygdaloidal structure: In the volcanic rocks the vesicles were filled up with the secondary minerals (calcite, zeolite, quartz etc), these minerals resemble almond shape and hence are called amygdales; the structure is called amygdaloidal structure.</p>  | 5 |
| 45 | | <p>It is a typical structure of metamorphic rocks characterized by an essentially granular character. The individual grains equi dimensional and are interlocking. Foliation is absent or negligible. Rocks with granular structure are termed as granulite. The texture exhibited is granulose. Ex: Marble and Quartzite</p> | 5 |

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| 46. | <p>Quartzite: Quartzites are granular metamorphic rocks composed chiefly of intersutured grains of quartz. Quartzite is metamorphosed product of sandstone due to dynamothermal metamorphism. It generally contains subordinate amount of micas, feldspars and some amphiboles. These are generally very hard and strong. It finds extensive use in building and road construction and glass industry.</p> <p>Limestone: Limestone is the fine grained calcareous rock consisting calcite mineral as the chief constituent. It exhibits non clastic texture. The chemical composition is CaCO_3. The cementing material is calcareous. The rock shows effervescence with dilute hydrochloric acid.</p> | 5 |
| 47. | <ol style="list-style-type: none"> 1. The shell is bivalved, equilateral and inequivalved. 2. The valves are plano-convex. 3. Umbo is prominent on ventral valve with a pedicle opening. 4. Hinge line is short and curved. Hinge area is small. 5. Concentric growth lines are present, and are more near anterior end indicating rapid growth of the shell. 6. The shell is composed of calcium carbonate, representing Cretaceous age. <p>Or</p>  | 5 |

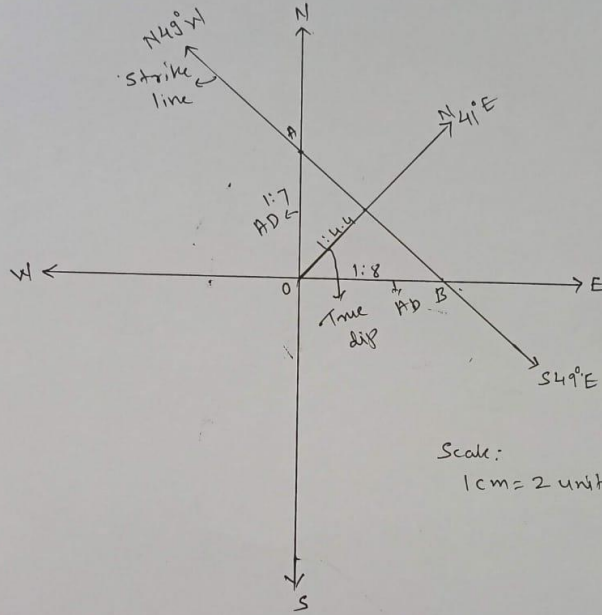
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| 48. | a. | <p>Leaf is simple and entire, tongue-shaped with smooth margin. The mid rib of the leaf is very prominent. The apex of the leaf is acute and its base is narrow. The leaf contains a few parallel veins and venation is reticulate. The length of the leaf ranges from 30 to 40 cm from the base to apex. Occasionally, seeds are found preserved along the entire margin of the leaf. Hence it is classified under seed fern. It ranges from Carboniferous to Permian (lower Gondwana).</p> <p>Or</p>  | 2.5 |
| | b. | <ol style="list-style-type: none"> 1. The shell is univalved, thick, and fusiform or spindle shaped. 2. The spire is short and is acute angled. 3. The aperture is long, oval with long anterior canal exhibiting siphonostomatus nature. The posterior canal is also seen. 4. The aperture is dextral 5. The outer lip is thick and the inner lip is reflected and shows the presence of pseudoteeth. 6. The spiral and transverse ornamentations are seen. 7. The surface of the shell shows coloured shining enamel. 8. The shell is composed of calcium carbonate (CaCO₃). <p>The given specimen is Fusus, representing Cretaceous to Present age.</p> <p>Or</p>  | 2.5 |
| 49. | | <p>Brunton compass is an instrument used in the field to measure the attitude of beds. It was designed by a Canadian Geologist D.W.Brunton. The Brunton compass has three main parts they are box, sighting arm, and lid. The box contains the most important component- 1) the magnetic needle that always indicates North; 2) The box is having two graduated circles,</p> | |

one upper circle is used to measure the direction and the inner circle is used to measure the dip angle in degrees. This also has two leveling bubbles to take accurate measurements. The lid is attached to the box with hinge contains the mirror with axial line and a sighting window.

50.

5

Q.No. 50: Dip & strike problem



Result:- Amount of True dip = 1:4.4
 Direction of True dip = N41°E
 Direction of Strike = N49°W - S49°E