

NB: Draw neat Diagrams wherever necessary. Max.Marks 100 Duration 3 Hours

Q1A Fill in the blanks. 10*1 = 10

- i) GABBRO is a plutonic equivalent of basalt.
- ii) Igneous rock containing less than 45 wt % of silica is classified as ULTRAMAFIC
- iii) A tabular-disoncordant igneous structure formed due by emplacement of magma cutting across the parallel layers of country rock is identified as DYKE.
- iv) Agents of metamorphism are pressure, temperature and CHEMICALLY ACTIVE FLUIDS/ FLUIDS.
- v) Particle ranging in diameter from 2mm to 1/16mm is identified as SAND size.
- vi) Clay sized and silt particle size is together called as MUD size.
- vii) Prehnite-pumpellyite facies are indicate LOW grade of metamorphism.
- viii) A colony of coral growing around a constantly submerging volcanic island is called as coral REEF.
- ix) The record of interaction between the soundwaves and subsurface is applied in SEISMIC method used in mineral exploration.
- x) In ELECTRIC method of sub surface mineral exploration a record of current passing through subsurface is used to determine lithology.

Q1B Define the following. 10*1 = 10

- i) Ultramafic rock- rock with LESS THAN 45 % OF SiO₂
- ii) Sill- concordant body of igneous rocks running parallel to host rock strata.
- iii) Volcanic rocks- rocks which crystallize on surface
- iv) Argillaceous rocks- rocks with particles smaller than 1/16 mm.
- v) Matrix- network which binds together all the grains in a sedimentary rock.
- vi) Tenor- valuable ore present per ton.
- vii) Clay sized particle particles less than 0.004mm in diameter.
- viii) P wave-primary waves which vibrate the medium particles in a direction parallel to wave propagation.
- ix) Lahar- volcanic mudslides
- x) Seismograph- instrument recording the seismic activity.

Q2 Answer any **Two** of the following. 2*10 = 20

- a) With the help of suitable diagram explain the discontinuous and continuous path of Bowen's reaction series. What are the various rock types that can be expected from the minerals that crystallize for particular temperatures along this series?
Bowen reaction series and its explanation along with diagram.

- b) Describe any two types of metamorphism.
Description of any two.
- c) With the help of suitable diagrams explain the crystallization history of a rock exhibiting porphyritic texture.
Sequence of crystallization along with suitable diagrams.
- d) What are metamorphic facies? What is the significance of metamorphic facies? Give the names of minerals assemblages of blueschist and greenschist facies for mafic protolith.
Description and diagrams.

Q3 Answer any **Two** of the following. 2*10 = 20

- a) What are various sedimentary structures observed in sedimentary rocks which can be used in determination of top of the strata? Explain any two of them with the help of suitable examples.
Any two sedimentary structures, Diagram and description.
- b) Gold particles or nuggets collected in a river stream that is cutting through a gold bearing quartz vein will be identified as which type of ore deposit? Write a note on these types of deposits.
Alluvial Placer Deposit. Description along with the diagram.
- c) What are terrigenous rocks? Give the brief classification of sedimentary rocks.
Rocks which are greater than 2mm in size, description,
- d) Describe various types of processes associated with early magmatic ore deposits.
types of processes discussed in brief.

Q4 Answer any **Two** of the following. 2*10 = 20

- a) Write a note on seismic method used for the sub-surface exploration.
Diagram and description
- b) With the help of suitable diagrams explain various terminology associated with underground mining.
Diagram and description
- c) What are S-waves? What property of S-waves is useful in determination of internal structure of the Earth? Write a note on any two surface waves generated during an Earthquake.
Diagram and description
- d) Write a note on various types of body and surface waves generated during an Earthquake.
Diagram and description

Q5 Describe any **Four** of the following.

4*5=20

- a) Magmatic differentiation
Diagram and description
- b) Magmatic assimilation
Diagram and description
- c) Late magmatic ore deposits
Diagram and description
- d) Cavity filling hydrothermal ore deposits
Diagram and description
- e) Tsunami
Description
- f) Atoll
Diagram and description