

General geology and Geo-tectonics

1. The time taken for light from the sun to reach the earth is :
 - a) 499.720 secs
 - b) 499.012 secs
 - c) 489.720 secs
 - d) 489.012 secs
2. The most powerful radio object in the universe after the sun is/are :
 - a) Black Holes
 - b) Quasars
 - c) Jupiter
 - d) Venus
3. Which of the following planets show the same "size-bearing"?
 - a) Earth-Mars
 - b) Earth-Venus
 - c) Mars-Venus
 - d) Venus-Mercury
4. Which of the following possess both stellar and planetary characteristics?
 - a) Jupiter
 - b) Venus
 - c) Saturn
 - d) Pluto
5. The Asteroid belt area between Mars and Jupiter extends from:
 - a) 2.2 to 3.6 A.U
 - b) 2.2 to 4.8 A.U
 - c) 3.6 to 4.8 A.U
 - d) 4.8 to 6.4 A.U
6. Which of the following planets has the least density ?
 - a) Earth
 - b) Mars
 - c) Venus
 - d) Saturn
 - e) Pluto
7. The difference between the equatorial and polar diameters of the Earth is :
 - a) 21 km
 - b) 43 km
 - c) 56 km
 - d) 28 km
8. The Mohorovicic discontinuity is a :
 - a) Compositional boundary
 - b) Phase-change boundary
 - c) Compositional as well as phase change boundary
 - d) None of the above
9. Beneath the oceans, the MOHO lies at a depth of :
 - a) 7-9 km

- b) 10-12 km
 - c) 14-16 km
 - d) 20-25 km
10. The temperature of the MOHO beneath the continents range from:
- a) $150^{\circ}\text{C} - 200^{\circ}\text{C}$
 - b) $200^{\circ}\text{C} - 500^{\circ}\text{C}$
 - c) $500^{\circ}\text{C} - 700^{\circ}\text{C}$
 - d) $700^{\circ}\text{C} - 900^{\circ}\text{C}$
11. Olympus Mons, the largest known volcano in the Solar System is found on the surface of :
- a) Earth
 - b) Moon
 - c) Mars
 - d) Jupiter
12. The "Nebular Hypothesis" was proposed by :
- a) Kant
 - b) Laplace
 - c) Kant and Laplace together
 - d) Kant and Laplace independently
13. The spacing of planets is best explained by :
- a) Dynamic Encounter theory
 - b) Planetesimal hypothesis
 - c) Nebular Hypothesis
 - d) Tidal hypothesis
14. The Moho discontinuity lies at a depth of :
- a) 2900 km
 - b) 3160 km
 - c) 4980 km
 - d) 5200 km
15. The Earth's crust is thickest under :
- a) Shield areas
 - b) Platforms
 - c) Phanerozoic orogenic belts
 - d) Archaean greenstone belts

Physical Geology and geomorphology

1. Physical weathering is NOT characteristic of :
 - a) Polar Regions
 - b) Hot deserts
 - c) Cold deserts
 - d) None of the above
2. Exfoliation is a form of
 - a) Physical weathering
 - b) Chemical weathering
 - c) Biochemical weathering
 - d) Mass wasting
3. Exfoliation is most characteristically found in
 - a) Granites
 - b) Spilites
 - c) Arkoses
 - d) Orthoquartzites
4. Which one of the following places is more likely to be affected by chemical weathering ?
 - a) Thar desert
 - b) Tibetan plateau
 - c) Leh
 - d) Siwalik
5. Mass wasting or "gravitative transfer" is NOT a result of
 - a) Vertical movements
 - b) Lateral movements
 - c) Diagonal movements
 - d) Spiral movements
6. Lateral movements of a series of blocks away from a centre is described as
 - a) Sliding
 - b) Gliding
 - c) Spreading
 - d) Cambering
 - e) Flow
7. The slow downslope movements of saturated rock debris which is NOT confined to definite channels is described as
 - A) Debris slide
 - B) Mud flow
 - C) Solifluction
 - D) Soil creep
8. Which of the following does not result from the lateral movements of rock debris ?
 - A) Spreading
 - B) Solifluction
 - C) Cambering

- D) Sackung
9. Solifluction and Gelifluction were the important processes of mass wasting during
- A) Archaean
 - B) Proterozoic
 - C) Miocene
 - D) Pliocene
 - E) Pliocene
10. Mushroom shaped structures having slender column and wide tops resulting from the abrasive action of wind are described as
- A) Ventifacts
 - B) Brazil nuts
 - C) Pedestal rocks
 - D) Draas
11. Which of the following fractures denote furrow deflation?
- A) Hohlwegs
 - B) Desert pavements
 - C) Blow outs
 - D) Playas
12. Which of the following is NOT an erosional feature of wind?
- A) Zeugen
 - B) Yardang
 - C) Serir
 - D) Hohlweg
13. Loess is a non-stratified, well-sorted Aeolian deposit composed of _____ grade fragments
- A) Sand
 - B) Silt
 - C) Clay
 - D) Pebble
14. The Aeolian features that have been noticed in the planet Mars are
- A) Zeugens
 - B) Yardangs
 - C) Inselbergs
 - D) Barchans
15. Flat topped hills or small mountains formed by stream action are called
- A) Mesas
 - B) Buttes
 - C) Cuestas
 - D) Stream terraces

Crystallography

1. A plane of symmetry is always
 - A) Parallel to a possible edge of the crystal
 - B) Parallel to a possible face of the crystal
 - C) Perpendicular to a possible face of the crystal
 - D) None of the above
2. Which of the following are orthogonal systems?
 - A) Cubic, tetragonal, orthorhombic
 - B) Tetragonal, hexagonal, trigonal
 - C) Orthorhombic, monoclinic, triclinic
 - D) Tetragonal, hexagonal, orthorhombic
3. A solid in which a face on one side is opposite a point on the other is definitely
 - A) Centrosymmetric
 - B) Non-centrosymmetric
 - C) Enantiomorphous
 - D) Hemihedral
4. There are 48 different forms in crystals. Of these the cubic system has
 - A) 9 forms
 - B) 15 forms
 - C) 23 forms
 - D) 33 forms
5. Any two faces of a form are called "congruent" if one face can be brought into the position of the other by
 - A) Rotation
 - B) Reflection
 - C) Inversion
 - D) All of the above
6. Which of the following systems has all closed forms?
 - A) Triclinic
 - B) Monoclinic
 - C) Trigonal
 - D) Cubic
7. Axial planes are planes of symmetry which
 - A) Bisect 'a' and 'c' axes
 - B) Bisect 'b' and 'c' axes
 - C) Enclose only one crystallographic axis
 - D) Enclose two crystallographic axes
8. Of the 48 naturally occurring forms _____ are closed and _____ are open
 - A) 30, 18
 - B) 18, 30
 - C) 22, 26
 - D) 26, 22
9. Which of the following is NOT a closed form

- A) Rhombohedron
 - B) Scalenohedron
 - C) Trapezohedron
 - D) None of the above
10. A crystal form consisting of only one face is
- A) Sphenoid
 - B) Basal pinacoid
 - C) Pedion
 - D) Dome
11. A 'pyramid' is described as a form whose face always cuts
- A) A-axis
 - B) B-axis
 - C) C- axis
 - D) All of the above
12. Domes may be considered as
- A) Vertical prisms
 - B) Non-verical prisms
 - C) Vertical pyramids
 - D) Non-vertical pyramids
13. Tapexohedraon is a form that occurs in
- A) Hexagonal system
 - B) Trigonal system
 - C) Tetragonal system
 - D) All of the above
14. Scalenotedron is a form having
- A) 8 faces
 - B) 12 faces
 - C) Either 8 or 12 faces
 - D) 24 faces
15. A rhombohedraon has
- A) Vertical symmetry planes
 - B) Horizontal symmetry planes
 - C) Diagonal symmetry planes
 - D) Hextetrahedral

Mineralogy

1. A mineral may be defined as
 - a) A heterogenous solid body which occurs naturally
 - b) An inorganically formed substance having a definis chemical composition and occurring naturally
 - c) A heterogenous solid body characterized by an orderly arrangement of atoms
 - d) None of the above

2. The simplest of all the silicate structures is that of
 - a) Orthosilicates
 - b) Sorosilicates
 - c) Metasilicates
 - d) Ionosilicates

3. Epidote exhibits
 - a) Nesosilicate structure
 - b) Sorosilicate structure
 - c) A combination of Neso- and Sorosilicate structures
 - d) A three dimensional framework

4. Minerals exhibiting 'Metasilicate' structure are characterized by
 - a) Tetrahedra independent of one another
 - b) Tetrahedra forming closed units having a ring-like structure
 - c) Tetrahedra occurring in pairs and the sharing of one oxygen between two silicons
 - d) Tetrahedra forming a three dimensional network

5. Which of the following shows a 6-membned ring structure ?
 - a) Benitoiite
 - b) Tourmaline
 - c) Beryl
 - d) Axinite

- *6. The maximum amcunt of substiuion of Al for Si is found in

- a) Orthoclase
- b) Microcline
- c) Albite
- d) Anorthite

7. In a three dimensional network

- a) One oxygen is shared between two tetrahedra
- b) Two oxygens of each tetrahedron are shared
- c) Three oxygens of each tetrahedron are shared
- d) All oxygen atoms of each tetrahedron are shared

8. Prismatic habits are characteristic of

- a) Nesosilicates
- b) Ionosilicates
- c) Metasilicates
- d) Phyllosilicates

9. Which of the following is a non-diagnostic property ?

- a) Colour
- b) Streak
- c) Luster
- d) Hardness

10. Minerals which exhibit constant and characteristic colouration are known as

- a) Pseudochromatic
- b) Allochromatic
- c) Idiochromatic
- d) Parachromatic

11. Cobalt imparts blue colour to a mineral when it is surrounded by

- a) Six oxygen atoms
- b) Four oxygen atoms

- c) Three oxygen, atoms
 - d) Two oxygen atoms
12. The purple colour of Amethyst is due to the presence of
- a) Titanium
 - b) Manganese
 - c) Iron
 - d) Chromium
13. 'Play of colour' is a property resulting from
- a) Low dispersion
 - b) High dispersion
 - c) Low interference
 - d) High interference
14. The phenomenon in which the surfacial covering of thin layers of a mineral exhibit different colours in different directions is described as
- a) Iridescence
 - b) Opalescence
 - c) Change of colours
 - d) Pleochroism
15. 'Luster' is defined as the appearance of a mineral in
- a) White light
 - b) Monochromatic light
 - c) Incident light
 - d) Reflected light

Optical Mineralogy

1.The wave theory of light was proposed by

- a) Newton
- b) Huygens
- c) Maxwell
- d) All of the above

2.Which of the following theories of light could explain all the properties of light ?

- a) Corpuscular theory
- b) Wave theory
- c) Electromagnetic theory
- d) Quantum theory

3.The surface determined at a given instant by all the parts -A* a system of waves travelling along the same direction and in the same phase is called

- a) Electric vector
- b) Wave length
- c) Wave front
- d) Wave surface

4.According to Brewster's law, polarization is maximum when the direction of reflection and refraction are

- a) 30° apart
- b) 60° apart
- c) 90° apart
- d) Parallel

5.Which of the following properties is NOT observed under ordinary light ?

- a) Colour
- b) inclusions
- c) R.I.
- d) Pleochroism

6.Which of the following properties is observed under convergent light ?

- a) Pleochroism
- b) Isotropic and anisotropic character
- c) Thinning
- d) Optic sign

7. Match the following and Property

- a). Cleavage
- b). Twinkling
- c). Twinning
- d). Dispersion

8. choose the correct answer Nature of light

- 1. Plane polarized light
- 2. Ordinary light
- 3. Crossed nicols
- 4. Convergent light

9. Leucite shows

- a) Star-like inclusions
- b) Curved inclusions
- c) Radial inclusions
- d) Straight inclusions

10. Calcite has maximum birefringence. This is best reflected which of the following properties ?

- a) Pleochroism
- b) Twinkling
- c) Anisotropism
- d) Twinkling

11. Extinction angle is the angle between

- a) The light position and the dark position of a mineral
- b) The zero of the circular scale and the dark position

- c) The vibration direction of the lower and the upper nicols
- d) A vibration plane and a crystallographic direction mineral section

12. Pleochroism and pleochroic halos are observed by using

- a) Polarizer only
- b) Analyzer only
- c) Both polarizer and the analyzer
- d) Polarizer, analyzer and the iris diaphragm

13. A Uniaxial mineral is said to be positive when

- a) The velocity of E.R. is more than that of OR
- b) The R.I. of E.R. is less than that of OR
- c) The R.I. of E.R. is more than that of OR
- d) None of the above

14. In Quartz

- a) $n_e = 1.553$ $n_o = 1.558$
- b) $n_e = 1.553$ $n_o = 1.486$
- c) $n_e = 1.553$ $n_o = 1.544$
- d) $n_e = 1.486$ $n_o = 1.658$

15. The light ray that comes out of the Nicol prism is

- a) OR which vibrates parallel to the short diagonal of the rhomb face at the end of the Nicol
- b) ER which vibrates parallel to the short diagonal of the rhomb face at the end of the Nicol
- c) OR which vibrates parallel to the long diagonal of the rhomb face at the end of the Nicol
- d) ER which vibrates parallel to the long diagonal of the rhomb face at the end of the Nicol

Geochemistry.

1. All the elements and their isotopes are believed to have synthesized from the nuclei of
 - a) Hydrogen
 - b) Helium
 - c) Oxygen
 - d) Nitrogen
2. Choose the correct statement among the following
 - a) Gaseous elements are most abundant in the universe
 - b) Elements in the solid state are most abundant in the universe
 - c) Elements in the gaseous and solid state are equally abundant
 - d) None of the above
3. Which of the following is the correct order of elemental abundance in the universe?
 - a) H₂ > He > O > N₂
 - b) H₂ > He > O > N₂ > Ne
 - c) H₂ > He > O > Ne > N₂
 - d) H₂ > He > N₂ > O > Ne
4. Of all the known elements those that occur naturally are at.
 - a) 92
 - b) 96
 - c) 102
 - d) 106
- *5. Of all the naturally occurring elements which one has not been detected in the universe?
 - a) Technetium
 - b) Tantalum
 - c) Osmium
 - d) Promethium
6. According to the Oddo-Harkins Rule

- a) Elements of even atomic number are more abundant than those of odd atomic number
 - b) Elements of odd atomic number are more abundant than those of even atomic number
 - c) Elements of even and odd atomic numbers are equally abundant in the universe
 - d) None of the above
7. Which of the following have least Electro-Negativity (E.N.)
- a) Lithophiles
 - b) Chalcophiles
 - c) Siderophiles
 - d) Atmophiles
8. A mineral that is unknown on the earth but found on the moon is
- a) Promethium
 - b) Armacolite
 - c) Tantalum
 - d) Teschenium
9. The crust consists of
- a) About 95% of silicate minerals
 - b) About 75% of silicate minerals
 - c) Over 50% of quartz
 - d) Over 50% of non-silicates
10. Which of the following groups is characterized by the presence of metallic bonds ?
- a) Lithophiles
 - b) Chalcophiles
 - c) Siderophiles
 - d) Atmophiles
11. Elements with completely full outermost shells are grouped under
- a) Lithophiles

- b) Chalcophiles
 - c) Siderophiles
 - d) Atmophiles
12. Comouflage is a type of ionic-atomic substitution which takes place in two atoms having
- a) Same charge and similar radius
 - b) Same charge and lower radius
 - c) Same charge and higher radius
 - d) Lower charge and similar radius
 - e) Higher charge and similar radius
13. the most abundant minerals in the earth's crust belongs to
- a) quartz
 - b) pyroxenes
 - c) plagioclase feldspars
 - d) potash feldspars
14. rubidium is usually found dispersed in
- a) K- rich minerals
 - b) Ca- rich minerals
 - c) Na- rich minerals
 - d) Al- rich minerals
15. Elements having a strong affinity for silicates are known as
- a) siderophiles
 - b) chalcophiles
 - c) Lithophiles
 - d) Atmophiles

Structural Geology

1. Structural Geology deals with matters in the
 - a) Solid state
 - b) liquid state
 - c) Gaseous state
 - d) All of the above
2. The 'true dip' of a bed is considered to be a
 - a) Vector quantity
 - b) Scalar quantity
 - c) either vector or scalar quantity
 - d) Neither vector nor scalar quantity
3. The dip of a horizontal bed striking E-W is measured in
 - a) Horizontal plane
 - b) Vertical plane
 - c) Axial plane
 - d) Inclined plane
4. The amount of dip measured along the strike direction vertical bed is always
 - a) 90°
 - b) $60'$
 - c) $45''$
 - d) zero
5. The maximum amount of dip of a bed is measured a $N 40^\circ E$. The strike direction of the bed is
 - a) N—S
 - b) E—W
 - c) $N 50^\circ W$

d) S 50°W

6. Isogons are defined as the points joining beds of
- a) Equal thickness
 - b) Equal dip amount
 - c) Same age
 - d) Same strike direction
 - e) Equal elevation above the sea level
7. Silicon is the second most abundant element in the earth's crust after oxygen. It occupies---% of the total volume of the crust
- a) 27%
 - b) 21%
 - c) 4%
 - d) 15%
8. The most abundant minerals in the earth's crust belongs to
- a) Quartz
 - b) Pyroxenes
 - c) Plagioclase feldspars
 - d) Potash feldspars
9. Which is the most correct sequence of the elemental abundance in the earth ?
- a) $O > Si > Mg > Fe > Al$
 - b) $O > Si > Al > Mg > Fe$
 - c) $Fe > O > Si > Mg > Al$
 - d) $Fe > O > Si > Al > Mg$
- *10. The order of abundance of elements on the moon is
- a) $O > Si > Mg > Fe > Ca$
 - b) $O > Si > Al > Mg > Ca$
 - c) $O > Si > Mg > Al > Fe$

d) $0 > \text{Si} > \text{Fe} > \text{Al} > \text{Ca}$

11. 'Isobars' are different elements with
- a) same at. wt. but different at. nos.
 - b) different at. wts. but same at. no.
 - c) different at. wts. and different at. nos.
 - d) same number of neutrons but different number of protons in the nucleus
12. 'Isotones' are characterized by
- a) same number of neutrons in the nucleus
 - b) same number of neutrons but different number of protons
 - c) same number of neutrons, but different number of protons and different atomic weights
 - d) different number of neutrons and protons but nearly same atomic number
13. In a strata composed of horizontal beds, one outcropping at higher contours is
- a) Less resistant than the lower ones
 - b) More resistant than the lower ones
 - c) Older than the lower ones
 - d) Younger than the lower ones In the case of dipping beds,
14. progressively younger beds occur along the direction of dip if
- a) $\text{Dip} > \text{Slope}$
 - b) $\text{Dip} < \text{Slope}$
 - c) $\text{Dip} = \text{Slope}$
 - d) None of the above
15. The behaviour of perfectly elastic bodies is governed by
- a) Hooke's law
 - b) Hilt's law
 - c) Lambert's law
 - d) Bode's law

Paleontology

1. 'Taphonomy' is the science dealing with
 - a) Study of the conditions of burial of fossils
 - b) Reconstruction of paleo-environments by means of fossils
 - c) Modes of preservation of fossils
 - d) Study of fossil pores and spores
2. Which of the following modes of preservation of fossils is rare?
 - a) Preservation of the entire organism
 - b) Preservation of hard parts
 - c) Preservation of original form
 - d) Alteration of hard parts
3. Jelly fishes and worms are mostly preserved by
 - a) Silicification
 - b) Carbonization
 - c) Petrification
 - d) Pyritization
4. 'Petrification' is a type of fossilization where
 - a) Original form is preserved
 - b) Original form and structure and preserved
 - c) Entire organism is preserved
 - d) Only the hard parts are preserved
5. The exoskeleton of sponges is made up of
 - a) Silica
 - b) Calcite

- c) Aragonite
 - d) Calcium phosphate
6. Fossil fecal pellets of ancient animals are described as
- a) Gastroliths
 - b) Coproliths
 - c) Beekite rings
 - d) Pseudo-fossils
7. The most favourable environment for the preservation of fossils
- a) Terrestrial
 - b) Lacustrine
 - c) Fluvial
 - d) Marine
8. The term 'Living fossil ' refers to
- a) a species which was thought to be extinct but which is in fact living
 - b) a species which has acquired the characters of its predecessors
 - c) a species which has retained all the primitive characters of its ancestors and has survived much longer than its counterparts
 - d) a species which is at its acme of evolution
9. Living fossils exhibit the phenomenon of
- a) Bradytelic evolution
 - b) Orthogenesis
 - c) Palingenesis
 - d) Tachygenesis
10. Which of the following is NOT a living fossil ?
- a) Lingula
 - b) Nucula
 - c) Nautilus
 - d) Nummulites

11. Which of the following can be considered as a 'Living Fossil' among the mammals ?
- a) Ginkgo
 - b) Opossum
 - c) Neopilina
 - d) Sphenodon
12. Superficial similarities in the morphology of members of different Phyla is described as
- a) Homology
 - b) Homeomorphy
 - c) Homomorphy
 - d) Paedomorphosis
13. The passing of a feature of the adult stage of the ancestor into the ontogenies of descendents is described as
- a) Hypomorphosis
 - b) Paedomorphosis
 - c) Neoteny
 - d) Gerontomorphosis
14. 'Neoteny' is described as
- a) The retention of larval characters in the adult form
 - b) The hereditary characters acquired by the off-springs from their ancestors
 - c) Mutation- induced in an individual due to environmental effects
 - d) The regeneration of fragile parts in an individual
15. The time of rapid evolutionary change of a new taxa or the adaptive radiation is described as
- a) Tachytelic evolution
 - b) Bradytelic evolution
 - c) Orthogenesis
 - d) Paragenesis

Principles of Stratigraphy

1. The litho-stratigraphic classification was first adopted in
 - a) Central Africa
 - b) Western Europe
 - c) USA
 - d) UK

2. The proterozoic formations were first described from a shield area of
 - a) Canada
 - b) Brazil
 - c) India
 - d) South America

3. Which of the following systems was established later than the others in the group?
 - a) Cambrian
 - b) Ordovician
 - c) Silurian
 - d) Devonian

4. The stages Georgian, Acadian and Potsdamian belong to
 - a) Cambrian
 - b) Ordovician
 - c) Silurian
 - d) Devonian

5. The Neogene period includes
 - a) Paleocene and Eocene
 - b) Paleocene, Eocene and Oligocene
 - c) Oligocene, Miocene and Pliocene

- d) Miocene and Pliocene
6. The transitional formations between the U. Cretaceous Palaeocene known as the "Passage beds" are represented worldwide by the
- a) Maastrichtian stage
 - b) Danian stage
 - c) Montain stage
 - d) Landenian stage
7. 'Permian' is named after Term' a province in
- a) USA
 - b) USSR
 - c) UK
 - d) FRG
8. The type locality for triassic is
- a) Canada
 - b) England
 - c) Russia
 - d) Germany
9. The first fundamental generalisation of stratigraphy is
- a) Order of Superposition
 - b) Principle of uniformitarianism
 - c) Law of Faunal succession
 - d) Stratigraphic analysis
10. If the deposition takes place in a cave
- a) It follows the law of superposition
 - b) It does not follow the law of superposition
 - c) It may or may not follow the law of superposition
 - d) None of the above
11. The correlation of precambrian terranes is mostly based on:

- a) Lithology
- b) Fossils
- c) Crustal upliftment
- d) Eustatic changes

12. Which of the following has been used for lithological tions ?

- a) Kaolin
- b) Fuller's earth
- c) bentonites
- d) Ball clays

13. According to the LAW OF FAUNAL Succession

- a) The fossil content of each formation is non diagnostic
- b) The fossil assemblage of each formation is the same as of the overlying and the underlying formations
- c) The fossil assemblage of each formations is very disti and characteristic of it
- d) The fossils in a formation are arranged successively ding to their age

14. The chief characteristics of a good index fossil are (1) presence of complicated structures (2) Presence of simple structures (3) Ability to float or swin (4) Tendency to remain stationary or attached

- a) 1 and 4 are correct
- b) 1 and 3 are correct
- c) 2 and 3 are correct
- d) 2 and 4 are correct

15. A community of interrelated organisms inhabiting aD described as

- a) Biotype
- b) Thenatocoenose
- c) Biocenose
- d) Thenotype

Indian Geology

1. The two-fold classification of the Precambrian into the loc' Archaen and the upper Proterozoic Groups was first intr. duced in
 - a) Canada
 - b) Western Australia
 - c) South America
 - d) Northern Europe
2. The Main Unconformity separating the Archaen and Proter: zoic successions occur at
 - a) 3200 M.Y.
 - b) 2750 M.Y.
 - c) 2500 M.Y.
 - d) 1600 M.Y.
3. Which one of the following marks the boundary between Archaen and the Proterozoic formations in India ?
 - a) Untala Granite
 - b) Berach Granite
 - c) Erinpura Granite
 - d) Idar Granite
4. The Dharwar sbdists have been named as
 - a) Older Greenstone belt
 - b) Newer Greenstone belt
 - c) Sargur Schist Complex
 - d) Fundamental Gneissic Complex
5. The Keewatians of Canada are correlated with
 - a) The Sargur Schist Complex
 - b) The Dharwar Supergroup

- c) The Cuddapah Supergroup
 - d) The Vindhyan Supergroup
6. The type area for the Sausar Group is
- a) Western Rajasthan
 - b) Nagpur-Bhandara
 - c) Singhbhum (Bihar)
 - d) Chindwara (M.P.)
7. The emplacement of Erinpura Granite marks the close of
- a) Dharwar orogeny
 - b) Delhi orogeny
 - c) Eastern Ghat orogeny
 - d) Satpura orogeny
8. The Erinpura Granite is a
- a) Hornblende granite
 - b) Biotite granite
 - c) Hornblende-biotite granite
 - d) None of the above
9. Among the following, the oldest rocks belong to
- a) Sargur Schist Complex
 - b) Banded Gneissic Complex
 - c) Older Metamorphic Group
 - d) Iron Ore Group
10. The unmetamorphosed facies of the Aravallis is termed as
- a) Binota shales
 - b) Ranthambor formation
 - c) Kothan series
 - d) Khardeola grits

11. Match the following and choose the correct answer (A) Kolhan orogeny (1) 1660 M.Y. (B) Satpura orogeny (2) 1600 M.Y (C) Eastern Ghat orogeny (3) 1000 M.Y. (D) Delhi orogeny (4) 950 M.Y.
- a) A-4 B-1 C-2 D —3
 - b) A-3 B-1 C-2 D-4
 - c) A-4 B-3 C-2 B-1
 - d) A-3 B-2 C-4 D-1 12.
12. The Granite gneiss of the Chotanagpur area is named as
- a) Bezwada Gneiss
 - b) Kailasa Gneiss
 - c) Hosur Gneiss
 - d) Dome Gneiss
13. Which of the following represents the transitional phase from the Azoic to Phanerozoic eons of the earth's history ?
- a) Riphean
 - b) V:ndian
 - c) Georgia
 - d) Acadian
14. Which of the following belongs to the lower Purana forms-tions of the northern Peninsula ?
- a) Pakhal Group
 - b) Kaladgi Group
 - c) Chattisgarh Group
 - d) Koihan Group
15. The Cuddapah Basin is
- a) Linear
 - b) Curved
 - c) Curvo-linear
 - d) Concavo-convex linear

Igneous Petrology

1. Ijolite is a
 - a) felsic alkaline rock
 - b) mafic alkaline rock
 - c) ultramafic alkaline rock
 - d) volcanic rock

2. Nephelinite is the volcanic equivalent of
 - a) Ijolite
 - b) Melteigite
 - c) Nepheline syenite
 - d) Peridotite

3. Which of the following is an example of a potassic alkaline ultrabasic lava ?
 - a) Serpentinite
 - b) Essexite
 - c) Ijolite
 - d) Leucitite

4. The change in the magma composition from tholeiitic to alkaline °coi-1 the oceanic islands as a result of
 - a) variation in lithospheric thickness
 - b) thickening of the lithosphere
 - c) thinning of the lithosphere
 - d) variation in the asthenospheric thickness

5. The line which demarcates the charnockitic and non-charnockitic regions in Peninsular India is described as

- a) Eparchaen unconformity
 - b) Oldham's line
 - c) Fermor's line
 - d) Holland's demarcation zone
6. Continental alkaline rocks are distinguished from basaltic and tholeiitic rocks by
- a) their high LILE and LREE contents
 - b) their high LILE and low LREE contents
 - c) their high LILE and LREE and low HREE contents
 - d) their low LILE and LREE and high HREE contents
7. The tholeiitic magma series is characteristic of
- a) extensional stress regimes
 - b) compressional stress regimes
 - c) both compressional and extensional stress regimes
 - d) none of the above
8. The Agpaitic Index is denoted by
- a) $\text{Na}_2\text{O} + \text{K}_2\text{O} / \text{Al}_2\text{O}_3$
 - b) $\text{Na}_2\text{O} / (\text{Na}_2\text{O} + \text{K}_2\text{O})$
 - c) $\text{Al}_2\text{O}_3 / (\text{Na}_2\text{O} + \text{K}_2\text{O})$
 - d) $(\text{Fe}_2\text{O}_3 + \text{FeO}) / (\text{Na}_2\text{O} + \text{K}_2\text{O})$
9. Mode of Derivation 1) by emplacement into non-orogenic settings 2) from melting of subducted oceanic crust 3) from igneous or meta-igneous rocks 4) from sources which have undergone atleast one weathering cycle
- a) A-1 B-2 C-4 D-3
 - b) A-2 B-4 C-1 D-3
 - c) A-1 B-3 C-2 D-4
 - d) A-4 B-3 C-1 D-2
10. The A-type granitoids are characteristic of
- a) tensional environments

- b) compressional environments
- c) either tensional or compressional environments
- d) none of the above

11. Which of the following is NOT a characteristic feature of S-type granites?

- a) High K_2O/Na_2O
- b) High $Al_2O_3/Na_2O + CaO$
- c) Low Sr^{87}/Sr^{86}
- d) Presence of Hornblende in mineral assemblages

12. Which of the following can be classified as an 'alkaline rock'?

- a) hornblende-granite
- b) hornblende-syenite
- c) riebeckite-granite
- d) biotite-granite

13. Which of the following is true of "alkaline rocks"? 1) alkaline rocks may be silica-oversaturated, saturated or unsaturated 2) they normally contain alkali-rich mafics 3) normatively, these rocks contain nepheline and/or acm he

- a) 1,2 and 3 are correct
- b) 1 and 3 are correct
- c) 2 and 3 are correct
- d) none of the above are correct

Sedimentary Petrology

1. The smallest megascopic layer in a sedimentary sequence is a
 - a) Bed
 - b) Stratum
 - c) Lamina
 - d) All of the above

2. To be classified as 'laminae', the thickness of each layer should be
 - a) >1 cm
 - b) <1 cm
 - c) >2an
 - d) <2cm

3. A bedset consists of two or more superimposed beds having identical
 - a) Colour
 - b) Composition
 - c) Texture
 - d) Internal structure
 - e) Genesis

4. Which of the following statements is NOT correct? 1) Variation in composition and texture is a characteristic feature of laminae. 2) Internally the laminae are not megascopically layered. 3) A lamina has a smaller (or the same) areal extent as enclosing bed. 4) A lamina forms in a longer period of time than the enclosing bed.
 - a) I only
 - b). 1 and 4 only
 - c) 1, 3 and 4 only
 - d) all of the above are correct

5. The Tlysch' sequences are characterised by
 - a) Discontinuous, unequal beds, laterally variable in thickness
 - b) Continuous equal or sub-equal beds, laterally uniform in thickness

- c) Continuous unequal beds, laterally uniform in thickness
 - d) Discontinuous, equal or sub-equal beds, laterally variable in thickness
6. Which of the following is an example of bedding plane markings or irregularities found on the base of the bed?
- a) Load casts
 - b) Ripple marks
 - c) Rain prints
 - d) Ball and Pillow
7. structure 'Parting Lineation' is found
- a) on the top of beds
 - b) on the base of beds
 - c) within the beds
 - d) any of the above
8. Alternate deposition of fine and coarse-grained sediment gives rise to
- a) Torrential bedding
 - b) Cross bedding
 - c) graded bedding
 - d) Festoon bedding
9. Flaser bedding is
- a) a ripple bedding in which mud streaks alternate with sand and silt surfaces
 - b) a ripple bedding which exhibits well-preserved sand lenses embedded within the muddy layers
 - c) a discordant bedding exhibiting lateral gradation
 - d) a concordant bedding exhibiting progressive fining in the upward direction
10. The most common mode of origin for cross-bedding is
- a) Migration of small and mega-ripples
 - b) Deposition on the point bars of small meanders
 - c) Deposition on the inclined surfaces of beaches

- d) Lee-side deposition of sand dunes
11. The bundle-wise up building of foreset laminae in a single unit is characteristically seen in
- a) Longitudinal cross-bedding
 - b) Channel-fill cross-bedding
 - c) Wave-ripple bedding
 - d) Climbing-ripple lamination
12. Aeolian ripples are characterized by the presence of
- a) Coarser grains on the crests
 - b) Finer grains on the crests
 - c) Uniformly even grains on the crests and the troughs
 - d) None of the above
13. The horizontal angle between the meridian and the horizontal projection of the dip line of the foreset in a cross-stratified layer is described as
- a) Scale
 - b) Inclination
 - c) Dip angle
 - d) Azimuth
14. Ripples formed by water and wind differ in their
- a) Symmetry
 - b) Scale
 - c) Azimuth
 - d) Ripple index
15. Ripple index (R.I.) is the wavelength of the ripple divided by its amplitude. If the R.I. > 15 it may be presumed that the ripples are formed by the action of
- a) Water
 - b) Wind
 - c) Waves
 - d) Currents

Metamorphic Petrology

1. Which of the following is/are characteristic of the process of metamorphism?
 - a) under normal conditions the bulk chemistry of the rock remains unchanged
 - b) there is no large-scale liquid at any given time
 - c) there is no order of crystallization
 - d) all of the above

2. The main type of chemical reaction involved in the process of metamorphism is
 - a) Solid \rightarrow Solid + Vapour
 - b) Solid + Liquid \rightarrow Solid + Gas
 - c) Liquid + Liquid \rightarrow Solid
 - d) Liquid + Gas \rightarrow Solid

3. The thermal or contact metamorphism is characterized by
 - a). High temperature, low pressure, low strain and variable fluid pressure
 - b) High temperature, high pressure, low strain and variable fluid pressure
 - c) High temperature, low pressure, variable strain and variable fluid pressure
 - d) High temperature, high pressure,

4. high strain and high fluid pressure Which of the following rocks have NOT resulted due to contact metamorphism
 - a) Spotted slates
 - b) Hornfelses
 - c) Skarns
 - d) Augen

5. gneisses Hornfelses generally possess
 - a) Porphyroblastic fabric
 - b) Granoblastic fabric
 - c) A combination of porphyroblastic and granoblastic fabric

- d) Foliated fabric
6. Thermal metamorphism of dolomitic limestone with small siliceous impurity leads to the formation of
- a) Forsterite marble
 - b) Brucite marble
 - c) Serpentine marble
 - d) Tremolite marble
7. Metamorphism involving substantial addition or removal of materials generally termed as
- a) Contact metamorphism
 - b) Autometamorphism
 - c) Metasomatism
 - d) Pneumatolysis
8. The metamorphism involving the combined effect of uniform pressure and heat is described as
- a) Plutonic metamorphism
 - b) Dynamothermal metamorphism
 - c) Cataclastic metamorphism
 - d) Contact metamorphism
9. The development of tectonites is widespread in
- a) Dynamothermal metamorphism
 - b) Plutonic metamorphism
 - c) Cataclastic metamorphism
 - d) Pyrometamorphism
10. Which of the following is matched correctly ?
- a) Pyrometamorphism low temperatures
 - b) Contact metamorphism high temperatures
 - c) Kinetic metamorphism —directed pressure predominant
 - d) Pneumatolysis —changes due to solution action
11. Choose the correct statement from the following

- a) Uniform pressure acts on both liquids and solids
 - b) Directed pressure causes a change in volume
 - c) Uniform pressure leads to a change of surface
 - d) All of the above are correct
12. When uniform or hydrostatic pressure acts on a body, its
- a) Volume decreases
 - b) Specific gravity decreases
 - c) Volume decreases but specific gravity increases
 - d) Volume increases but specific gravity decreases
13. Which of the following effects takes place when a body is subjected to directed pressure ? i) Dilation ii) Distortion iii) Formation of uni-dimensional grains iv) Growth of the body in a direction perpendicular to the directed stress v) Solubility of the minerals is decreased
- a) (i), (iii), (iv) and (v) only
 - b) (i), (iii) and (iv) only
 - c) (ii), (iii), (iv) and (v) only
 - d) (ii), (iii) and (iv) only
14. Oriented mineral grains and foliated appearance of the rocks is a characteristic feature of the rocks belonging to
- a) Epizone
 - b) Mesozone
 - c) Katazone
 - d) Epizone and Katazone
15. Which of the following rocks are completely unfoliated?
- a) Slates
 - b) Schists
 - c) Phyllites
 - d) Hornfelses

Economic Geology

1. A body of oil and gas or both occurring in a separate reservoir under a single pressure system is described as
 - a) pool
 - b) field
 - c) province
 - d) region

2. Which of the following represents "solid petroleum"?
 - a) Tar
 - b) Asphalt
 - c) Wax
 - d) None of the above
 - e) All of the above

3. In situ deposits of petroleum formed by heavier residues as a result of the evaporation of lighter fractions are known as
 - a) Insolubilized deposits
 - b) Bitumen exudates
 - c) Tar Sands
 - d) Vein bitumens

4. Ozokerite is an example of
 - a) Oil shale
 - b) Tar sand
 - c) Mineral wax
 - d) Coal

5. The correct sequence of encountering oil in a drill well is
 - a) gas-oil-water

b) water-gas-oil

c) gas-water-oil

d) oil-water-gas

6. The number of sedimentary basins in India is

a) 15

b) 22

c) 27

d) 33

7. The Digboi oil field is associated with the Tippam Sandstones, which are of

a) Eocene age

b) Miocene age

c) Oligocene age

d) Pliocene age

8. In India oil was struck for the first time in limestones at

a) Ankleshwar

b) Kaikalur

c) Ravva

d) Bombay High

9. The Gandhar field in Gujarat is famous for the occurrence of

a) oil only

b) . gas only

c) both oil and gas

d) none of the above

10. The reservoir rocks at the Bombay High are predominantly

a) biomicrites

b) biosparites

c) oosparites

d) oomicrites

11. According to the Oil and Natural Gas Corporation (ONGC), the "low risk-high return" sedimentary basins of India are classified under
- a) Category I
 - b) Category II
 - c) Category III
 - d) Category IV
12. Which of the following is NOT matched correctly?
- a) Krishna-Godavari Basin ...Kaikalur
 - b) Cauvery BasinNarimanam
 - c) Bombay High..... Heera & Panna
 - d) Cambay Basin Razole
13. Cambay Shale, the oil-producing horizon of the Gandhar onland field, is of age.
- a) Eocene
 - b) Miocene
 - c) Oligocene
 - d) Pleistocene
14. The theory that primarily owes the origin of petroleum to reactions between alkali metals and carbondioxide at high temperatures was postulated by
- a) Sebatiers and Sederen (1902)
 - b) Berthelot (1917)
 - c) Byasson (1871)
 - d) None of the above

Applied Geology

A. EXPLORATION METHODS

1. The outcrops of manganese deposits exhibit colour.
 - a) Black
 - b) Brown
 - c) Maroon
 - d) Waxy green

2. If an outcrop of a mineral deposit shows a prominent pinkish colour it indicates the presence of deposits underneath.
 - a) Nickel
 - b) Uranium
 - c) Arsenic
 - d) Copper

3. A surface outcrop of limonite indicates the presence underneath of
 - a) Copper deposits only
 - b) Copper and some sulphide deposits
 - c) Copper and some oxide deposits
 - d) Oxides, Carbonates and Sulphides

4. The ochreous orange colour of limonite indicates the presence of
 - a) Galena
 - b) Molybdenite
 - c) Sphalerite
 - d) Bornite

5. As one moves from the Tropical to concentration of limestones
 - a) increases Indicative
 - b) decreases
 - c) first increases then decreases

- d) first decreases then increases
6. Chloritic alteration of wall rocks is NOT a feature of
- a) Clastic sedimentary rocks
 - b) Non-clastic sedimentary rocks
 - c) Acid igneous rocks
 - d) Metamorphic rocks
7. Extensive dolomitization is a characteristic feature of
- a) molybdenum deposits
 - b) copper deposits
 - c) gold-silver deposits
 - d) lead-zinc deposits
8. Titanium-magnetite deposits are often found associated with
- a) acid plutonic rocks
 - b) acid volcanic rocks
 - c) basic plutonic rocks
 - d) basic volcanic rocks
9. The Structure of Bombay High is
- a) Doubly plunging anticline
 - b) Doubly plunging syncline
 - c) Non-Plunging anticline
 - d) Non-plunging syncline
10. The Bauxite deposits of Orissa are associated with
- a) positive topographic forms
 - b) negative topographic forms
 - c) structural elevations
 - d) tectonic deeps
- Certain minerals show their oxidation products in the form of distinct 'blooms' that can be spotted from air if in sufficiently high concentrations.
11. Pink 'blooms' are exhibited by

- a) cobalt
- b) vanadium
- c) uranium
- d) lead

12. Which of the following minerals are most likely to occur together?

- a) Va-Cu-Ni
- b) Ni-Co-Au
- c) Pb-Zn-Cu
- d) Va-U-Fe

13. The Graphite deposits of Kalahandi, the Garnet deposits of Rajasthan and the Kyanite deposits of Singhbhum are associated with

- a) Igneous rocks
- b) Sedimentary rocks
- c) Metamorphic rocks
- d) All of the above

14. 'Trenching' involves

- a) linear excavations
- b) linear excavations in which one dimension is longer than the other
- c) drilling wedge-shaped bore holes
- d) digging even-sized pits 'Drilling' is employed for 1) determining the stratigraphic or rock sequence