

2/19

ENTRANCE EXAMINATION FOR ADMISSION, MAY 2010.

M.Sc. (APPLIED GEOLOGY)

COURSE CODE : 367

Register Number :



*Signature of the Invigilator
(with date)*

COURSE CODE : 367

Time : 2 Hours

Max : 400 Marks

Instructions to Candidates :

1. Write your Register Number within the box provided on the top of this page and fill in the page 1 of the answer sheet using pen.
2. Do not write your name anywhere in this booklet or answer sheet. Violation of this entails disqualification.
3. Read each question carefully and shade the relevant answer (A) or (B) or (C) or (D) in the relevant box of the ANSWER SHEET using HB pencil.
4. Avoid blind guessing. A wrong answer will fetch you -1 mark and the correct answer will fetch 4 marks.
5. Do not write anything in the question paper. Use the white sheets attached at the end for rough works.
6. Do not open the question paper until the start signal is given.
7. Do not attempt to answer after stop signal is given. Any such attempt will disqualify your candidature.
8. On stop signal, keep the question paper and the answer sheet on your table and wait for the invigilator to collect them.
9. Use of Calculators, Tables, etc. are prohibited.

1. A coarse grained rock mainly composed of orthopyroxene and plagioclase is called as
 (A) Norite (B) Gabbro (C) Lherzolite (D) Harzburgite
2. Which of the following is a concordant intrusive body?
 (A) Cone sheet (B) Ring dike (C) Stock (D) Lopolith
3. When a single pyroxene envelops several well-developed plagioclase laths, the texture is called as
 (A) Ophitic texture (B) Poikiloblast (C) Porphyroblast (D) Granoblast
4. Pyroclastic deposits are usually found associated with
 (A) Explosive volcano (B) Shield volcano
 (C) Pahoehoe flow (D) Ropy lava
5. Grains that crystallize to a significantly larger size than those of the matrix, in an igneous rocks are called
 (A) Phenocrysts (B) Porphyroblasts
 (C) Xenoliths (D) Relic inclusions
6. Slices of oceanic crust that have been emplaced (obducted) onto continental crust
 (A) Mylonite (B) Migmatite (C) Ophiolite (D) Granulite
7. Outer core is liquid while the inner core is solid because
 (A) Outer core is heated more than the inner core
 (B) Melting point of material in outer core is less than the ambient temperature while it is more for the material in inner core due to higher pressure
 (C) Outer core is in contact with liquid mantle
 (D) Inner core is rich in iron and nickel while outer core is not
8. Earth's crust consists of continental and oceanic parts. Which of the following statement is **not** true
 (A) Oceanic crust has global layering while continental crust doesn't.
 (B) Oceanic crust is thinner compared to continental crust
 (C) Oceanic crust is younger than continental crust
 (D) Oceanic crust is more metamorphosed compared to continental crust

9. Which of the following regions would have thicker crust
(A) Mountain belt (B) Mid Oceanic ridges
(C) Precambrian Shield (D) Island arc
10. Continental crust is higher in elevation than oceanic crust because
(A) It is more buoyant than oceanic crust
(B) It is older than oceanic crust
(C) It is younger than oceanic crust
(D) It is denser than oceanic crust
11. The average thickness of a lithospheric plate is approximately
(A) 35 km (B) 8 km (C) 5 km (D) 100 km
12. A crystal appears unchanged when rotated 180°. Such an axis of rotation is axis of
(A) 1-fold symmetry (B) 2-fold symmetry
(C) 3-fold symmetry (D) 4-fold symmetry
13. In a crystal 4 non-parallel faces intersect in a point. Form of these faces is
(A) Prism (B) Pinacoid (C) Pyramid (D) Dome
14. Electronegativity of elements increases
(A) From left to right of the Periodic table
(B) From right to left of the Periodic table
(C) In atoms that have partially filled outer shell
(D) With decrease in neutrons
15. Structurally quartz is a
(A) Framework silicate (B) Ring silicate
(C) Chain silicate (D) Isolated silicate
16. A mineral is scratchable by quartz but not by apatite. Hardness of this mineral on Mohs scale is
(A) Less than apatite (B) less than 7
(C) more than 7 (D) less than 5
17. Which of the following mineral is a chain silicate
(A) Augite (B) Biotite (C) Anorthite (D) Olivine

18. Which of the following is a K-feldspar
(A) Oligoclase (B) Orthoclase (C) Andesine (D) Anorthite
19. If a set of equivalent crystal faces are related to each other by a three fold axis of rotation, what will be angle between these faces?
(A) 30° (B) 60° (C) 90° (D) 120°
20. Which one of the following minerals crystallize in the Orthorhombic system?
(A) Calcite (B) Aragonite (C) Rhodochrosite (D) Dolomite
21. Which one of the following minerals crystallize in cubic system?
(A) Spinel (B) Siderite (C) Hematite (D) Corundum
22. Which one of the following mineral belongs to spinel group?
(A) Zircon (B) Ilmenite (C) Hematite (D) Magnetite
23. The axial ratio of a crystal is determined as 0.82 : 1.94. Which crystal system this may belong to?
(A) Isometric or Tetragonal (B) Hexagonal or Tetragonal
(C) Orthorhombic or Monoclinic (D) Isometric or Hexagonal
24. Which one of the following is an open form?
(A) Prism (B) Octahedron (C) Tetrahedron (D) Pyramid
25. Which one of the following is permitted in the Miller's indices?
(A) Zero (B) Infinity (C) Real numbers (D) Fractions
26. Which one of the following forms belongs to the isometric system?
(A) Pyramid (B) Prism (C) Octahedral (D) Sphenoid
27. A Pyroxene mineral having equal amount of CaO and FeO molecules is known as
(A) Hedenbergite (B) Pigeonite (C) Bronzite (D) Diopside
28. Plagioclase having 30 to 50 % anorthite content is known as
(A) Anorthoclase (B) Andesine (C) Oligoclase (D) Labradorite

29. Which one of the following statements about Andalusite, Kyanite and Sillimanite is WRONG?
- (A) They have same chemical formula
 - (B) Commonly one of them is present in Metamorphosed peptic rocks
 - (C) If all the three are present the pressure and temperature conditions can be determined.
 - (D) They have same crystal structure
30. A rock containing Phenocrysts of Olivine set in a fine grained matrix of pyroxene and plagioclase is known as
- (A) Gabbro (B) Basalt (C) Norite (D) Diorite
31. The major minerals present in granite are
- (A) Microcline, quartz and albite (B) Sanidine, quartz and labradorite
 - (C) Orthoclase, quartz and nepheline (D) Nepheline, quartz and labradorite
32. Volcanic equivalent of the plutonic rock granodiorite is
- (A) Rhyolite (B) Rhodacite (C) Dacite (D) Andesite
33. At the binary eutectic which of the following phases coexist
- (A) A crystal phase and a liquid
 - (B) Two different crystal phases and a liquid
 - (C) Two different crystal phases
 - (D) Three different crystal phases
34. Complete solid solution is exhibited at 1 atmospheric pressure by
- (A) Albite – Anorthite (B) Diopside – Enstatite
 - (C) Enstatite – Ferrosilite (D) Actinolite – Tremolite
35. Komatites are typically found in
- (A) Archean greenstone belts (B) Proterozoic mobile belts
 - (C) Proterozoic sedimentary basins (D) Tertiary volcanic provinces
36. Predominant magma that erupted during the Deccan Volcanism is
- (A) Alkali basalt (B) Tholeiitic basalt
 - (C) Andesite (D) Trachyte

37. If the orientation of the principal stress axes X, Y and Z does not change during the deformation, the deformation is known as
 (A) Simple shear (B) Pure shear (C) Triaxial stress (D) Axial strain
38. A fold which is concave upward is called as
 (A) Synform (B) Antiform (C) Syncline (D) Anticline
39. A fold in which younging direction is away from the fold core is called
 (A) Synform (B) Antiform (C) Syncline (D) Anticline
40. Fold with alternate sharp and broad hinges are called
 (A) Chevron fold (B) Cuspate fold
 (C) Box fold (D) Concentric fold
41. If the axial planar cleavage is steeper than the dip of the fold limb, then limb is called
 (A) Normal limb (B) Overturned limb
 (C) Back limb (D) Inverted limb
42. If rake/pitch of the net slip on the fault plane is 90° , then the fault will be
 (A) Dip-slip fault (B) Strike-slip fault
 (C) Oblique slip fault (D) Hinge (Oblique) fault
43. If the strike of a dip slip normal fault is $N30^\circ E$, then the trend of the net slip will be
 (A) $N60^\circ E$ (B) $S60^\circ E$ (C) $N30^\circ W$ (D) $S30^\circ W$
44. Metamorphic facies are defined by the
 (A) Critical mineral assemblages
 (B) Texture and structure of the rock types
 (C) Particular rock type
 (D) Pressure-Temperature condition
45. Metamorphic grade refers to
 (A) Particular rock type
 (B) Intensity of metamorphism
 (C) Texture and structure of the rock types
 (D) Critical mineral assemblages

46. Which of the following metamorphic facies is characterized by maximum temperature and minimum pressures
- (A) Blueschist (B) Greenschist
(C) Hornblende-hornfels facies (D) Sanidinite facies
47. The mineral omphacite is characteristic of
- (A) Greenschist facies (B) Granulite facies
(C) Blueschist facies (D) Eclogite facies
48. In case of Barrovian metamorphism, the lowest grade of metamorphism is marked by the mineral
- (A) Biotite (B) Garnet (C) Chlorite (D) Kyanite
49. Anhydrous rocks are characteristically present in rocks belonging to
- (A) Eclogite facies (B) Greenschist facies
(C) Amphibolite facies (D) Granulite facies
50. The reaction Ferrosilite + Diopside = Enstatite + Hedenbergite, is a kind of
- (A) Solid-solid net-transfer reaction (B) Devolatilization reaction
(C) Ion-exchange reaction (D) Oxidation reaction
51. In the triangular ACF diagrams used to designate the mineralogical and chemical composition of metamorphic facies, the 'A' apex represent
- (A) Al_2O_3 (B) $\text{Al}_2\text{O}_3 + \text{Fe}_2\text{O}_3 - \text{Na}_2\text{O} - \text{K}_2\text{O}$
(C) $\text{Al}_2\text{O}_3 + \text{Fe}_2\text{O}_3 - \text{K}_2\text{O}$ (D) $\text{Al}_2\text{O}_3 + \text{Na}_2\text{O} + \text{K}_2\text{O}$
52. Paired metamorphic belt is a characteristic feature of
- (A) Continental collision zone (B) Subduction zone
(C) Sea floor spreading zone (D) Continental rift zone
53. Which of the metamorphic zone of Barrow is similar to the greenschist facies?
- (A) Biotite zone (B) Garnet zone
(C) Staurolite zone (D) Sillimanite zone
54. The high pressure polymorph of silica, coesite, stishovite, may be associated with
- (A) Hydrothermal metamorphism (B) Burial metamorphism
(C) Contact metamorphism (D) Impact metamorphism

55. Sedimentary breccia is a rare rock type because
- (A) Gravel is rounded quickly during transport
 - (B) Clay is less abundant than other sedimentary particles
 - (C) Feldspars are chemically unstable
 - (D) Sand deposits are typically well sorted
56. Which of the following is detrital sediment?
- (A) Broken sea shells
 - (B) Ions in solution
 - (C) Graded bedding
 - (D) Quartz sand
57. If an aggregate of sediment consists of particles that are all about the same size, it is said to be
- (A) Well sorted
 - (B) Sandstone
 - (C) Poorly rounded
 - (D) Lithified
58. Which of the following can be used to determine paleocurrent direction?
- (A) Mud cracks
 - (B) Turbidity currents
 - (C) Graded bedding
 - (D) Cross-bedding
59. Bedding or stratification in a sedimentary rock
- (A) Is due to directed pressure from earth forces
 - (B) Results from heat
 - (C) Is always exactly horizontal
 - (D) Represents variations which took place during deposition
60. The least stable material in clastic detritus is
- (A) Quartz
 - (B) Amphibole
 - (C) Olivine
 - (D) Hornblende
61. Graded bedding usually signifies
- (A) Fast-moving water that gradually slowed down
 - (B) Slow-moving water that gradually speeded up
 - (C) Stagnant water
 - (D) Deposition on dry land

62. Mud cracks are most likely to form by
 (A) Rapidly changing patterns of erosion and deposition
 (B) Gently oscillating waves
 (C) Periodic exposure to the air and drying out
 (D) Fast-moving water that gradually slowed down
63. Which would be least likely to indicate a desert environment?
 (A) Large cross-beds (B) Limestone
 (C) Evaporite (D) Mud cracks
64. Which of these environments can produce cross beds?
 (A) Sand dunes (B) River Deltas (C) Alluvial fans (D) All the above
65. In which of the following do foreset beds occur?
 (A) Alluvial fans (B) Deltas
 (C) Point bars (D) Natural levees
66. A drainage pattern in which streams flow in and out of lakes with irregular flow directions is
 (A) Radial (B) Rectangular (C) Longitudinal (D) Deranged
67. Erosional remnants of floodplains that are higher than the current level of a stream are :
 (A) Incised meanders (B) Cut banks
 (C) Natural bridges (D) Stream terraces
68. The dry lake beds in many deserts are
 (A) Playas (B) Pediments (C) Bajadas (D) Inselbergs
69. In uniform flat rocks, drainage patterns tend to be
 (A) Dendritic (B) Radial (C) Trellis (D) Braided
70. Mass wasting refers to material moved primarily by:
 (A) Wind (B) Running water (C) Ice (D) Gravity
71. The process whereby hydrogen and hydroxyl ions of water replace ions in minerals is:
 (A) Hydrolysis (B) Oxidation (C) Carbonization (D) Laterization

72. Why clay doesn't weather
 (A) The grains are too large
 (B) It is chemically stable at the surface
 (C) It doesn't occur in areas prone to weathering
 (D) It has too many ions
73. Coral reefs are generally found in
 (A) Polar region (B) Sub polar region
 (C) Tropical region (D) All regions
74. The Olive series is developed in
 (A) Simla (B) Kashmir (C) Kumaon (D) Salt range
75. What is the age of Muth quartzite ?
 (A) Ordovician (B) Silurian
 (C) Devonian (D) Carboniferous
76. Which group provides the fast moving invertebrate ?
 (A) Cephalopoda (B) Echinodermata
 (C) Gastropoda (D) Brachiopoda
77. When did the Trilobite disappear from the Earth?
 (A) End of Ordovician (B) End of Devonian
 (C) End of Permian (D) End of Jurassic
78. Petrified wood is an example of
 (A) Encrustation (B) Substitution (C) Altercation (D) Desiccation
79. Dinosaurs are reported from the rocks of
 (A) Paleozoic (B) Mesozoic (C) Tertiary (D) Quaternary
80. Petroleum and Natural gas are chiefly composed of
 (A) Hydrogen (B) Hydrogen & Carbon
 (C) Nitrogen (D) Oxygen
81. The fossil contents of elementary canal of animals are known as
 (A) Burrows (B) Mould (C) Trails (D) Coprolites

82. One of the following is the rarest metal in the earth crust.
 (A) Gold (B) Platinum (C) Rhenium (D) Niobium
83. Wall rock alteration is a characteristic feature of
 (A) Magmatic deposits (B) Hydrothermal deposits
 (C) Metamorphic deposits (D) Volcano-sedimentary deposits
84. One of the following is an ore mineral of copper.
 (A) Bornite (B) Braunite (C) Bixbyite (D) Boehmite
85. Talc deposit can be formed by metasomatism of one of the following rocks.
 (A) Limestone (B) Shale
 (C) Ultramafic rock (D) Granite
86. The reason for the correct answer to the previous question is that this rock contains
 (A) Mg silicates (B) Fe silicates (C) Al silicates (D) Ca silicates
87. Identify the odd type of ore deposit among the following, by considering the age of known ore deposits.
 (A) Banded iron formation (B) Ferromanganese nodules
 (C) Lateritic bauxite (D) Phosphatic nodules
88. In the previous question, the odd type of ore deposit has formed in the following geological time.
 (A) Precambrian (B) Paleozoic (C) Mesozoic (D) Tertiary
89. What is called "green marble"?
 (A) Amphibolite (B) Pyroxenite (C) Peridotite (D) Serpentinite
90. "Green marble" is mined as building stone from
 (A) Amphibolite of Dharwar schist belts
 (B) Pyroxenite of Nausahi ultramafic complex
 (C) Peridotite of Sukinda ultramafic complex
 (D) Serpentinite of Rishabdev ultramafic belt

91. One of the following sulphide minerals can be translucent or transparent.
(A) Pyrite (B) Chalcopyrite (C) Sphalerite (D) Galena
92. One of the following oxide minerals can be translucent or transparent.
(A) Chromite (B) Pyrolusite (C) Wolframite (D) Cassiterite
93. Gold deposits are NOT associated with one of the following.
(A) Laterite (B) Banded iron formation
(C) Conglomerate (D) Shale
94. Uranium deposits have NOT formed by one of the following processes.
(A) Detrital sedimentary (B) Circulation of groundwater
(C) Hydrothermal (D) Magmatic
95. Emerald is a gem variety of
(A) Corundum (B) Beryl (C) Topaz (D) Tourmaline
96. Which one of the following pairs of minerals is NOT dimorphic?
(A) Graphite-diamond (B) Calcite-aragonite
(C) Magnetite-hematite (D) Kyanite-sillimanite
97. Contact metasomatic deposits are more common in
(A) Shale (B) Greywacke (C) Sandstone (D) Limestone
98. One of the following ore minerals does not contain copper.
(A) Covellite (B) Pyrrhotite (C) Bornite (D) Chalcocite
99. The largest zinc deposit in India is located at
(A) Zawar, Rajasthan (B) Agucha, Rajasthan
(C) Agnigundla, Andhra Pradesh (D) Sargipalle, Orissa
100. The largest bauxite mines in India is located at
(A) Panchpatmali, Orissa (B) Korba, Madhya Pradesh
(C) Yercaud, Tamil Nadu (D) Kolli Hills, Tamil Nadu