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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 slilicate

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) Biotitie (C) Anorthite (D) Olivine

18. Which of the following is a K-feldpar

(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) Dolerite

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 Pyroxine 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 valconic provinces

36. Predominant magma that erupted during the Deccan Volcanism is

(A) Alkali basalt (B) Tholeritic 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°E, then the trend of the net slip will be

(A) N60°E (B) S60°E (C) N30°W (D) S30°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) $Al_2O_3 + Fe_2O_3 - Na_2O - K_2O$

(C) $Al_2O_3 + Fe_2O_3 - K_2O$ (D) $Al_2O_3 + Na_2O + K_2O$

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) Burrial 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 transluscent or transparent.
(A) Pyrite (B) Chalcopyrite (C) Sphalerite (D) Galena

92. One of the following oxide minerals can be transluscent 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