

ENTRANCE EXAMINATION FOR ADMISSION, MAY 2012.

Ph.D. (DISASTER MANAGEMENT)

COURSE CODE : 147

Register Number :

Signature of the Invigilator
(with date)

COURSE CODE : 147

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 of the 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.

- The triple bond between the carbon atoms causes acetylene, C_2H_2 , to have which of the following shapes?
(A) Trigonal planar (pron: try-gon-al) (B) Linear
(C) Tetrahedral (D) Trigonal bipyramidal
- Which of the following four elements has the largest atomic radius? Is it:
(A) strontium (B) francium
(C) calcium (D) bromine
- Which of the following odors does the ester, methyl salicylate, produce? Is the odor that of:
(A) cinnamon (B) avocado
(C) orange (D) oil of wintergreen
- $Ca(BrO_3)_2$ (read: C - a, left parenthesis, B - r - O - subscript 3, right parenthesis, subscript 2) is called:
(A) calcium bromate (B) calcium bromite
(C) calcium dibromite (D) calcium bromide
- Which of the following are saturated aliphatic hydrocarbons?
(A) Alkanes (B) Alkenes
(C) Alkynes (D) Nixanes
- Sucrose, ordinary table sugar, may be classified as a:
(A) Monosaccharide (B) Disaccharide
(C) Polysaccharide (D) Oligosaccharide
- Pure water is approximately what molar concentration:
(A) .55 Molar (B) 5.5 Molar
(C) 55 Molar (D) 550 Molar
- The rate at which dissolution occurs is LEAST dependent upon which one of the following factors:
(A) temperature (B) pressure
(C) solution concentration (D) solute surface area

9. Who was the first American chemist to receive a Nobel Prize? He was selected in 1914 for his precise determination of atomic weights.
- (A) Edward Frankland (B) Theodore Richards
(C) John Bardeen (D) Paul Dirac
10. Of the following, which has units of "Pascal"?
- (A) Force (B) Volume
(C) Pressure (D) Viscosity
11. Which one of the following pairs of species have the same bond order?
- (A) CN^- and NO^+ (B) CN^- and CN^+
(C) O^- and CN^- (D) NO^+ and CN^+
12. Toluene is nitrated and the resulting product is reduced with tin and hydrochloric acid. The product so obtained is diazotised and then heated with cuprous bromide. The reaction mixture so formed contains
- (A) mixture of o- and p-bromotoluenes
(B) mixture of o- and p-dibromobenzenes
(C) mixture of o- and p-bromoanilines
(D) mixture of o- and m-bromotoluenes
13. Larger number of oxidation states are exhibited by the actinoids than those by the lanthanoids, the main reason being
- (A) 4f orbitals more diffused than the 5f orbitals
(B) lesser energy difference between 5f and 6d than between 4f and 5d orbitals
(C) more energy difference between 5f and 6d than between 4f and 5d orbitals
(D) more reactive nature of the actinoids than the lanthanoids
14. Which of the following factors is of no significance for roasting sulphide ores to the oxides and not subjecting the sulphide ores to carbon reduction directly?
- (A) Metal sulphides are thermodynamically more stable than CS_2
(B) CO_2 is thermodynamically more stable than CS_2
(C) Metal sulphides are less stable than the corresponding oxides
(D) CO_2 is more volatile than CS_2

15. α -D-(+)-glucose and β -D-(+)-glucose are
(A) conformers (B) epimers
(C) anomers (D) enantiomers
16. Among the following substituted silanes the one which will give rise to cross linked silicone polymer on hydrolysis is
(A) R_4Si (B) $RSiCl_3$
(C) R_2SiCl_2 (D) R_3SiCl
17. Fluorobenzene (C_6H_5F) can be synthesized in the laboratory
(A) by heating phenol with HF and KF
(B) from aniline by diazotisation followed by heating the diazonium salt with BF_3
(C) by direct fluorination of benzene with F_2 gas
(D) by reacting bromobenzene with NaF solution
18. A metal, M forms chlorides in its +2 and +4 oxidation states. Which of the following statements about these chlorides is correct?
(A) MCl_2 is more volatile than MCl_4
(B) MCl_2 is more soluble in anhydrous ethanol than MCl_4
(C) MCl_2 is more ionic than MCl_4
(D) MCl_2 is more easily hydrolysed than MCl_4
19. Which of the following statements is true?
(A) H_3PO_3 is a stronger acid than H_2SO_3
(B) In aqueous medium HF is a stronger acid than HCl
(C) $HClO_4$ is a weaker acid than $HClO_3$
(D) HNO_3 is a stronger acid than HNO_2
20. The IUPAC name for the complex $[Co(NO_2)(NH_3)_5]Cl_2$ is
(A) nitrito-N-pentaamminecobalt (III) chloride
(B) nitrito-N-pentaamminecobalt (II) chloride
(C) pentaammine nitrito-N-cobalt (II) chloride
(D) pentaammine nitrito-N-cobalt (III) chloride

21. Which one the following ions has the highest value of ionic radius?
(A) Li^+ (B) F^- (C) O_2^- (D) B_3^+
22. The ionic mobility of alkali metal ions in aqueous solution is maximum
(A) K^+ (B) Rb^+ (C) Li^+ (D) Na^+
23. Density of a 2.05 M solution of acetic acid in water is 1.02 g/mL. The molality of the solution is
(A) 1.14 mol kg^{-1} (B) 3.28 mol kg^{-1}
(C) 2.28 mol kg^{-1} (D) 0.44 mol kg^{-1}
24. How many EDTA (ethylenediaminetetraacetic acid) molecules are required to make an octahedral complex with a Ca^{2+} ion?
(A) Six (B) Three (C) One (D) Two
25. 18 g of glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) is added to 178.2 g of water. The vapour pressure of water for this aqueous solution at 100°C is
(A) 759.00 Torr (B) 7.60 Torr
(C) 76.00 Torr (D) 752.40 Torr
26. Which one of the following countries has the longest international boundary with India?
(A) Bangladesh (B) Bhutan
(C) China (D) Pakistan
27. Adam's bridge connects
(A) Amman and Damascus
(B) Dhanushkodi (Ramesvaram) and Talaimannar
(C) Israel and Jerusalem
(D) Persian Gulf and Gulf of Oman
28. Hawaiian Islands are located in
(A) South Pacific Ocean (B) North Pacific Ocean
(C) South Atlantic Ocean (D) North Atlantic Ocean

29. The Ocean between America and Europe is called
 (A) Pacific (B) Arctic
 (C) Atlantic (D) Southern
30. Ljubljana is a part of
 (A) Yugoslavia (B) Portugal
 (C) Romania (D) Russia
31. Fiji islands are a part of
 (A) Indonesia (B) Malaysia
 (C) Polynes (D) Australia
32. The Strait connecting Arabian Sea and the Bay of Bengal is
 (A) Bering Strait (B) Dover Strait
 (C) Palk Strait (D) Vermosa Strait
33. Myanmar is a new name of
 (A) Burma (B) Philippines
 (C) Thailand (D) Vietnam
34. Of the following, the country which is not in Oceania is
 (A) Fiji (B) Barbados
 (C) New Zealand (D) Papua New Guinea
35. Amongst the following, which is the largest island?
 (A) England (B) Japan
 (C) Borneo (D) New Guinea
36. Canary islands are dependencies of
 (A) Spain (B) Portugal (C) Germany (D) U.K.
37. The Strait which separates Asia from North America is
 (A) The Bering Strait (B) The Palk Strait
 (C) The Strait of Gibraltar (D) The Strait of Malacca

38. Long treeless grassy palms are characteristics of
(A) Campos (B) Llanos (C) Pampas (D) Prairies
39. Which of the following is not a desert?
(A) Gobi (B) Kalahari (C) Sahara (D) Cotopaxi
40. The highest waterfall of the world is
(A) Niagara Falls (B) Boyomar Falls
(C) Salto Angel Falls (D) Khone Falls
41. Which is the world's largest desert?
(A) Sahara (B) Gobi
(C) Thar (D) Takala Makan
42. Which of the following is the largest river in the world?
(A) Nile (B) Congo (C) Ganges (D) Amazon
43. Which of the following is the highest plateau in the world?
(A) Colorado Plateau (B) Pamir Plateau
(C) Patagonia Plateau (D) Potwar Plateau
44. Niagara Falls are in
(A) Australia (B) U.K.
(C) South Africa (D) USA
45. Which of the following pairs is not correctly matched?
(A) Algeria - Niger (B) Brazil - Amazon
(C) Iraq - Tigris (D) Myanmar - Irrawady
46. Petroleum deposits in India are found in
(A) Granite (B) Basalt
(C) Metamorphic rocks (D) Sedimentary rocks
47. The equatorial radius of the earth is approximately
(A) 12,700 km (B) 6,900 km
(C) 6,400 km (D) 11,600 km

48. The layer of atmosphere close to the earth's surface is called
(A) Exosphere (B) Ionosphere
(C) Stratosphere (D) Troposphere
49. The most abundant element in the earth's atmosphere is
(A) Argon (B) Nitrogen (C) Oxygen (D) Krypton
50. Which of the following river has the largest basin?
(A) Congo (B) Amazon (C) Nile (D) None
51. Why is our vulnerability to natural disasters growing?
(A) Because the frequency of volcanic eruptions is increasing
(B) Because the human population is increasing
(C) Because the number of earthquakes each year is increasing
(D) Because the number of floods each year is increasing
52. The theory of plate tectonics was not initially widely accepted because _____.
(A) land bridges would have blocked plate movement
(B) rocks of the Earth's crust were considered too stiff for continents to move through them
(C) fossils on South America and Africa did not match
(D) ocean floor mapping showed that older rocks occur away from mid-ocean ridges
53. Which of the following is a non-renewable energy resource?
(A) Solar (B) Methane
(C) Hydroelectric (D) Coal
54. The amount of oil that may become available for use is called oil _____.
(A) reserves (B) reservoirs
(C) resources (D) traps
55. A coal deposit that is not economical to mine today would be considered part of our _____.
(A) coal reserves (B) coal resources
(C) coal reservoirs (D) none of these

56. Chemical reactions triggered by _____ transform organic material into hydrocarbons.
- (A) solar energy (B) hydroelectric
(C) elevated temperatures (D) decomposition
57. Energy resources derived from natural organic materials are called _____.
- (A) geothermal energy sources (B) fossil fuels
(C) biomass (D) all of these
58. A permeable rock that contains hydrocarbon fluids and gasses is called a(n) _____.
- (A) oil trap (B) source bed
(C) oil reservoir (D) none of these
59. All oil traps contain _____.
- (A) an impermeable layer (B) an anticline
(C) a fault (D) all of these
60. Which of the following is least likely to contain an oil trap?
- (A) an anticline (B) fault
(C) natural stratigraphy (D) syncline
61. Which of the following rock types would most likely be the best oil reservoir?
- (A) granite (B) shale
(C) sandstone (D) salt
62. An undeformed sedimentary layer is _____ than the layer above and _____ than the layer below.
- (A) younger --- younger (B) younger --- older
(C) older --- younger (D) older --- older
63. Fossils are most common in which rock types?
- (A) sedimentary
(B) igneous
(C) metamorphic
(D) all of these commonly contain fossils

64. Which of the following describes the build up and release of stress during an earthquake?
- (A) The Modified Mercalli Scale
 - (B) The elastic rebound theory
 - (C) The principle of superposition
 - (D) The travel time difference
65. The amount of ground displacement in a earthquake is called the _____.
- (A) epicenter
 - (B) dip
 - (C) slip
 - (D) focus
66. The point where movement occurred which triggered the earthquake is the _____.
- (A) dip
 - (B) epicenter
 - (C) focus
 - (D) strike
67. Which of the following sequences correctly lists the different arrivals from first to last?
- (A) P waves ... S waves Surface waves
 - (B) Surface waves ... P waves S waves
 - (C) P waves ... Surface waves ... S waves
 - (D) S waves ... P waves Surface waves
68. How do rock particles move during the passage of a P wave through the rock?
- (A) Back and forth parallel to the direction of wave travel
 - (B) Back and forth perpendicular to the direction of wave travel
 - (C) In a rolling circular motion
 - (D) The particles do not move
69. Detailed studies of what earthquake allowed researchers to develop the elastic theory?
- (A) The 1906 San Francisco earthquake
 - (B) The 1964 Anchorage, Alaska earthquake
 - (C) The 1755 Lisbon, Portugal earthquake
 - (D) The 1985 Mexico City earthquake

70. How many seismograph stations are needed to locate the epicenter of an earthquake?
 (A) 1 (B) 2 (C) 3 (D) 4
71. Earthquakes can occur with _____ faulting.
 (A) normal (B) reverse (C) thrust (D) all of these
72. Approximately what percentage of earthquakes occur at plate boundaries?
 (A) 25% (B) 50% (C) 75% (D) 90%
73. Marble is a metamorphic rock that forms from a _____ parent.
 (A) Granite (B) Limestone (C) Sandstone (D) Shale
74. Mechanical weathering produces _____.
 (A) clay minerals (B) quartz
 (C) smaller particles (D) calcium carbonate
75. When liquid water freezes:
 (A) it does not change in volume
 (B) it expands by 5% in volume
 (C) it expands by 9% in volume
 (D) it decreases in volume
76. What is the term for the general process by which rocks are broken down at the surface?
 (A) Deposition (B) Erosion (C) Lithification (D) Weathering
77. Which of the following affect the rate of weathering?
 (A) The soil type and extent
 (B) The rock type
 (C) The climate
 (D) All of these affect weathering rates
78. Which of the following scientists is responsible for the exclusion principle which states that two objects may NOT occupy the same space at the same time? Was it:
 (A) Heisenberg Bohr (B) Bohr
 (C) Teller (D) Pauli

79. The force acting between two point charges can be computed using which of the following laws?
- (A) Ohm's Law (B) Ampere's Law
(C) Coulomb's Law (D) Newton's Second Law
80. Induced electric currents can be explained using which of the following laws?
- (A) Gauss's Law (B) Faraday's Law
(C) Ohm's Law (D) Ampere's Law
81. For a negative point charge, the electric field vectors:
- (A) circle the charge
(B) point radially in toward the charge
(C) point radially away from the charge
(D) cross at infinity
82. For an infinite sheet of positive charge, the electric field lines:
- (A) run parallel to the sheet of charge
(B) are perpendicular to the sheet of charge and point in toward the sheet
(C) are perpendicular to the sheet of charge and point away from the sheet
(D) fall off as one over r squared
83. Five coulombs of charge are placed on a thin-walled conducting shell. Once the charge has come to rest, the electric potential inside the hollow conducting shell is found to be:
- (A) zero
(B) uniform inside the sphere and equal to the electric potential on the surface of the sphere
(C) smaller than the electric potential outside the sphere
(D) varying as one over r squared
84. Geocentric Theory was proposed by
- (A) Copernicus (B) Ptolemy
(C) Tycho Brahe (D) Newton

85. In a uniform circular motion if the radius is doubled the centripetal force now required is
- (A) one-quarter as great as before
 (B) half as great as before
 (C) twice as great as before
 (D) four times as great as before
86. The electromagnetic radiations produced by oscillating electromagnetic oscillators of high frequency are
- (A) IR radiations (B) Micro waves
 (C) Radio waves (D) Y rays
87. When temperature of a semiconductor is raised, its energy gap _____.
- (A) increases (B) decreases
 (C) remains same (D) may increase or decrease
88. A semiconductor behaves as an insulator at:
- (A) -273°C (B) 0°C (C) 273°C (D) 300°C
89. The number of water molecules in carnallite are _____.
- (A) 4 (B) 5 (C) 6 (D) 7
90. Alkaline earth metals are chemically very reactive due to their _____ character.
- (A) electropositive (B) non responsive
 (C) electro negative (D) none
91. Which alkaline earth metal are more abundant in nature?
- (A) Magnesium and Calcium (B) Radium and Mercury
 (C) Dolomite and Barytes (D) Gypsum and Dolomite
92. The solvent in Alcohol solution is _____.
- (A) Water (B) Alcohol
 (C) Ammonia (D) Hydrochloric acid

93. Mathematical operations in a computer are done in
(A) Monitor (B) CPU (C) Keyboard (D) None
94. Sequence of instructions written in order to solve any problem is a _____.
(A) assembler (B) hardware (C) program (D) compilation
95. A man walks 4 m towards East and then 3 m towards North and there he fixes a pole 12 m high. The distance between the starting point and tip of the pole in space is
(A) 7 m (B) 11 m (C) 13 m (D) 19 m
96. A 9 cm high image of an object is formed on a screen by a convex lens. When the lens is displaced towards the screen, again a 4 cm high image is formed on the screen. The of the object is
(A) 6 cm (B) 6.25 cm
(C) 6.5 cm (D) None of these
97. In the sun, helium is produced from hydrogen by
(A) radioactive decay (B) disintegration
(C) fission (D) fusion
98. The half-life of an isotope of an element is 5 days. The mass of a 10 gram sample of this isotope remaining after 20 days is
(A) 0.312 grams (B) 0.625 grams
(C) 1.25 grams (D) 2.50 grams
99. The idea that electrons revolved in orbits around the nucleus of an atom without radiating energy away from the atom was postulated by
(A) Thompson (B) Bohr
(C) Rutherford (D) Einstein
100. Arriving at a generalization on the basis of a number of similar observation is called _____.
(A) Deductive Process (B) Inductive Process
(C) Scientific Process (D) Convention