

ENTRANCE EXAMINATION FOR ADMISSION, MAY 2013.

Ph.D. (DISASTER MANAGEMENT)

COURSE CODE : 147

Register Number :

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*Signature of the Invigilator*  
(with date)

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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 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. North-Western parts of India get winter rainfall mainly due to
 

(A) North-West monsoon	(B) Western disturbances
(C) North-East monsoon	(D) Retreating monsoon
  
2. Which valley is formed as a result of tectonic forces?
 

(A) 'V' -shaped valley	(B) 'U' -shaped valley
(C) Hanging valley	(D) Rift valley
  
3. Which forest is known for large scale lumbering?
 

(A) Equatorial forests	(B) Mixed forests
(C) Coniferous forests	(D) Monsoon forests
  
4. What is the chief characteristic of monsoon climate?
 

(A) Daily range of temperature very high	(B) Complete reversal of wind direction with the change of season
(C) Annual range of temperature very high	(D) Heavy rainfall mainly during winter
  
5. Soils are usually formed by the process of
 

(A) Erosion	(B) Deposition
(C) Denudation	(D) Weathering
  
6. Which group of maps are the large scale maps?
 

(A) Atlas and wall maps	(B) Thematic and political maps
(C) Physical and weather maps	(D) Cadastral and Tourist Guide maps
  
7. If the R.F. of a map is 1 : 10,00,000 what could be its statement of scale?
 

(A) 1 cm-10 km	(B) 1 cm-1 km
(C) 1 cm-100 km	(D) 1 cm-1000 km

8. Sugar industry in India has a tendency to migrate towards south because
- (A) The soils of South India are highly suitable for cultivation of sugarcane
  - (B) The climate of South India is more suitable for the production of sugarcane
  - (C) The per capita consumption of sugar in the South is more than the North
  - (D) The winds coming from the Bay of Bengal and Arabian Sea increase the sugar content in the sugarcane
9. Which of the following two rivers are navigable for big distances?
- (A) Godavari and Tungbhadra
  - (B) Narmada and Tapti
  - (C) Ganga and Brahamputra
  - (D) Damodar and Kosi
10. Gujarat is the largest producer of salt in India because
- (A) Its coastal waters are very saline
  - (B) It has extensive dry coast
  - (C) It has extensive shallow seas
  - (D) Its inhabitants are expert in preparing salt
11. Which soil is formed differently from the other three soils?
- (A) Regur
  - (B) Bhabar
  - (C) Bangar
  - (D) Khadar
12. Amongst the cereals, this has the largest production in India
- (A) Wheat
  - (B) Maize
  - (C) Rice
  - (D) Barley
13. The largest desert in the World is
- (A) Gobi
  - (B) Kalahari
  - (C) Patagonia
  - (D) Sahara
14. Ruhr region is situated in
- (A) Poland
  - (B) Russia
  - (C) Germany
  - (D) France

15. Earthquake waves are recorded in  
(A) Barograph (B) Hydrograph (C) Seismograph (D) Pantagraph
16. Which of these is young folded mountain?  
(A) The Himalayas (B) The Vindhyas  
(C) The Nilgiris (D) The Western Ghats
17. Ankaleshwar is famous for  
(A) Gold mining (B) Petrochemical Industry  
(C) Manufacturing Industry (D) Wheat production
18. Which country imports iron most?  
(A) Germany (B) France (C) Sweden (D) Japan
19. Chittaranjan is famous for  
(A) Cotton manufacturing Industry (B) Sugar Industry  
(C) Fertilizer Industry (D) Locomotive Industry
20. Which one is the biggest planet of the Solar system?  
(A) Mercury (B) Earth (C) Pluto (D) Jupiter
21. 'Meghalaya' is the name given to the region corresponding to  
(A) Lushai Hill Region (B) Garo-Khasi Hill Region  
(C) Nefa Region (D) Nagaland
22. Coal Is Believed to have been principally formed in which of the following types of environment?  
(A) riverbeds (B) swamps (C) volcanicregions (D) deserts
23. A rock composed of cemented sand and gravel is:  
(A) shale (B) conglomerate (C) granite (D) marble

24. When clay hardens into rock, it forms:  
(A) coal (B) limestone (C) shale (D) quartzite
25. Which geologic period doesnot belong in the Mesozoic era?  
(A) Permian (B) Cretaceous (C) Triassic (D) Jurassic
26. Fossils are rarely found in such rocks as:  
(A) Limestone (B) sandstone (C) shale (D) granite
27. The rock in which ground water is LEAST likely to form caverns is:  
(A) sandstone (B) limestone (C) salt (D) rock gypsum
28. The longest era was the  
(A) Mesozoic (B) Precambrian (C) Cenozoic (D) Paleozoic
29. On the Richter scale, a magnitude 6 earthquake is how much larger than a magnitude 4 earthquake?  
(A) 1.5 times (B) 4 times (C) 15 times (D) 100 times
30. The principal mineral in most sand beaches is  
(A) quartz (B) orthoclase (C) magnetite (D) muscovite
31. The oldest rocks that contain abundant fossils are:  
(A) Precambrian (B) Paleozoic  
(C) Mesozoic (D) Cenozoic
32. Ageologic feature called a kimberlite indicates the possibility of the presence of which of the following?  
(A) rubies (B) diamonds  
(C) sapphires (D) opals
33. Which of the following minerals is a source of lead?  
(A) Bauxite (B) Hematite  
(C) Malachite (D) Galena

34. The core of the earth is thought to be composed of which of the following?
- (A) basalt and granite (B) compressed gases  
(C) uranium and lead (D) iron and nickel
35. In geological studies, the Mohorovicic Discontinuity, commonly called the Moho, is the boundary between the
- (A) the mantle and the crust (B) asthenosphere and the mantle  
(C) mantle and the outer core (D) outer core and the inner core
36. Valleys formed by glaciers always have which of the following characteristics?
- (A) U-shaped cross sections (B) straight courses  
(C) uniform slopes (D) bed rock floors
37. When an object is lifted 10 meters, it gains a certain amount of potential energy. If the same object is lifted 20 meters, its potential energy gain is
- (A) less (B) the same  
(C) twice as much (D) four times as much.
38. A 1000-kg car and a 2000-kg car are hoisted the same distance in a gas station. Raising the more massive car requires
- (A) less work (B) as much work  
(C) twice as much work (D) four times as much work
39. An object that has kinetic energy must be
- (A) moving (B) falling  
(C) at an elevated position (D) at rest
40. An object that has potential energy may have this energy because of its
- (A) speed (B) acceleration  
(C) momentum (D) location

41. Bullets are fired from an airplane in the forward direction of motion. The momentum of the airplane will be
- (A) decreased (B) unchanged  
(C) increased (D) none
42. A clerk can lift containers a vertical distance of 1 meter or can roll them up a 2 meter-long ramp to the same elevation. With the ramp, the applied force required is about
- (A) half as much (B) twice as much  
(C) the same (D) none
43. A bow is drawn so that it has 40 J of potential energy. When fired, the arrow will ideally have a kinetic energy of
- (A) less than 40 J (B) more than 40 J  
(C) 40 J (D) 20 J
44. When a car is braked to a stop, its kinetic energy is transformed to
- (A) stopping energy (B) potential energy  
(C) energy of motion (D) heat
45. No work is done by gravity on a bowling ball that rolls along a bowling alley because
- (A) no force acts on the ball  
(B) no distance is covered by the ball.  
(C) the force on the ball is at right angles to the ball's motion.  
(D) no potential energy is being converted to kinetic energy.
46. Which requires more work: lifting a 50-kg sack vertically 2 meters or lifting a 25-kg sack vertically 4 meters?
- (A) lifting the 50-kg sack  
(B) lifting the 25-kg sack  
(C) Both require the same amount of work  
(D) none.

47. A 50-kg sack is lifted 2 meters in the same time as a 25-kg sack is lifted 4 meters. The power expended in raising the 50-kg sack compared to the power used to lift the 25-kg sack is
- (A) twice as much (B) half as much  
(C) the same (D) none
48. A TV set is pushed a distance of 2 m with a force of 20 N that is in the same direction as the set moves. How much work is done on the set?
- (A) 2 J (B) 10 J (C) 20 J (D) 40 J
49. One end of a long, uniform log is raised to shoulder level. Another identical log is raised at its center to the same level. Raising the second log requires about
- (A) the same amount of work (B) twice as much work  
(C) more than twice as much work (D) less than twice
50. Two identical arrows, one with twice the kinetic energy of the other, are fired into a hay bale. The faster arrow will penetrate
- (A) the same distance as the slower arrow  
(B) twice as far as the slower arrow  
(C) four times as far as the slower arrow  
(D) more than four times as far as the slower arrow.
51. A car moves 4 times as fast as another identical car. Compared to the slower car, the faster car has
- (A) 4 times the KE (B) 8 times the KE  
(C) 12 times the KE (D) 16 times the KE
52. A ball is projected into the air with 100 J of kinetic energy which is transformed to gravitational potential energy at the top of its trajectory. When it returns to its original level after encountering air resistance, its kinetic energy is
- (A) less than 100 J (B) more than 100 J  
(C) 100 J (D) not enough information given.

53. Strictly speaking, if any electrical device in your car is turned on (such as an air conditioner, headlights, or even a radio) more gasoline is burned by the engine. This statement is
- (A) totally false
  - (B) true only if the car's engine is running
  - (C) true only if the car's engine is stopped
  - (D) almost always true.
54. A machine puts out 100 Watts of power for every 1000 Watts put into it. The efficiency of the machine is
- (A) 10%
  - (B) 50%
  - (C) 90%
  - (D) 110%
55. An ungloved fist will do more damage to a jaw than a gloved fist. The reason for this is that the ungloved fist
- (A) delivers a larger impulse to the jaw
  - (B) exerts a larger force on the jaw
  - (C) has less air resistance on it
  - (D) none of these
56. A woman lifts a box from the floor. She then moves with constant speed to the other side of the room, where she puts the box down. How much work does she do on the box while walking across the floor at constant speed?
- (A) zero J
  - (B) more than zero J
  - (C) more information needed to determine
  - (D) less than 1
57. A car moving at 50 km/hr skids 20 m with locked brakes. How far will the car skid with locked brakes if it is traveling at 150 km/hr?
- (A) 20 m
  - (B) 60 m
  - (C) 90 m
  - (D) none
58. Which has greater kinetic energy, a car traveling at 30 km/hr or a car of half the mass traveling at 60 km/hr?
- (A) the 30 km/hr car
  - (B) the 60 km/hr car
  - (C) Both have the same kinetic energy
  - (D) the 15km/hr car

59. A diver who weighs 500 N steps off a diving board that is 10 m above the water. The diver hits the water with kinetic energy of  
 (A) 10 J (B) 500 J (C) 510 J (D) 5000 J
60. When a rifle is fired it recoils so both the bullet and rifle are set in motion. The rifle and bullet ideally acquire equal  
 (A) but opposite amounts of momentum (B) amounts of kinetic energy  
 (C) both of these (D) none of these
61. A moving object has  
 (A) speed (B) velocity  
 (C) momentum (D) all of these
62. What does an object have when moving that it never has when at rest?  
 (A) momentum (B) energy  
 (C) mass (D) inertia
63. If an object has kinetic energy, then it also must have  
 (A) impulse (B) momentum  
 (C) acceleration (D) force
64. If the speed of a moving object doubles, then what else doubles?  
 (A) momentum (B) kinetic energy  
 (C) acceleration (D) all of these
65. An object at rest may have  
 (A) speed (B) velocity (C) energy (D) momentum
66. A feather and a coin dropped in a vacuum fall with equal  
 (A) forces (B) momenta  
 (C) accelerations (D) kinetic energies
67. A heavy and a light object released from the same height in a vacuum have equal  
 (A) weights (B) momenta (C) energies (D) none of these
68. Two pool balls, each moving at 2 m/s, roll toward each other and collide. Suppose after bouncing apart, each moves at 4 m/s. This collision violates conservation of  
 (A) momentum (B) kinetic energy (C) both of these (D) none of these

69. Compared to a recoiling rifle, the bullet fired has a greater
- (A) momentum (B) kinetic energy  
(C) none of these (D) both of these
70. A bullet has more kinetic energy than the recoiling rifle from which it is fired is because the force on the bullet acts over a longer
- (A) time (B) distance  
(C) both of these (D) neither of these
71. An open freight car rolls friction free along a horizontal track in a pouring rain that falls vertically. As water accumulates in the car, the car's speed
- (A) increases (B) decreases  
(C) doesn't change (D) both increase and decrease
72. A car has a head-on collision with another car with the same magnitude of momentum. An identical car driving with the same speed as the first car runs into an enormously massive wall. The greater impulse will occur on the car that is in the collision with the
- (A) approaching car (B) the wall  
(C) both impulses will be the same (D) none
73. .023 g of sodium metal is reacted with  $100 \text{ cm}^3$  of water. The pH of the resulting solution is
- (A) 11 (B) 10 (C) 12 (D) 9
74. 0.5 mole of each of  $\text{H}_2$ ,  $\text{SO}_2$  and  $\text{CH}_4$  are kept in a container. A hole was made in the container. After 3 hours, the order of partial pressures in the container will be
- (A)  $p_{\text{H}_2} > p_{\text{SO}_2} > p_{\text{CH}_2}$  (B)  $p_{\text{H}_2} > p_{\text{CH}_2} > p_{\text{SO}_2}$   
(C)  $p_{\text{SO}_2} > p_{\text{H}_2} > p_{\text{CH}_2}$  (D)  $p_{\text{SO}_2} > p_{\text{CH}_4} > p_{\text{H}_2}$
75.  $10 \text{ cm}^3$  of 0.1 N monobasic acid requires  $15 \text{ cm}^3$  of sodium hydroxide solution whose normality is
- (A) 1.5 N (B) 0.15 N (C) 0.066 N (D) 0.66 N
76.  $10^{-6} \text{ M}$  NaOH is diluted 100 times. The pH of the diluted base is
- (A) between 6 and 7 (B) between 10 and 11  
(C) between 7 and 8 (D) between 5 and 6

77. 2 gm of a radioactive sample having half life of 15 days was synthesised on 1st Jan 2009. The amount of the sample left behind on 1st March, 2009 (including both the days)
- (A) 1 gm                      (B) 0.5 gm                      (C) 0 gm                      (D) 0.125 gm
78.  $2\text{HI}(\text{g}) \rightleftharpoons \text{H}_2(\text{g}) + \text{I}_2(\text{g})$  The equilibrium constant of the above reaction is 6.4 at 300 K. If 0.25 mole each of  $\text{H}_2$  and  $\text{I}_2$  are added to the system, the equilibrium constant will be
- (A) 3.2                      (B) 1.6                      (C) 6.4                      (D) 0.8
79.  $2\text{SO}_2(\text{g}) + \text{O}_2(\text{g})$  is an example for
- (A) irreversible reaction                      (B) heterogenous catalysis  
(C) homogenous catalysis                      (D) neutralisation reaction
80. 30 cc of HCl, 20 cc of 5  $\text{HNO}_3$  and 40 cc of NaOH solutions are mixed and the volume was made up to  $1 \text{ dm}^3$ . The pH of the resulting solution is
- (A) 1                      (B) 3                      (C) 8                      (D) 2
81. 5 moles of  $\text{SO}_2$  and 5 moles of  $\text{O}_2$  are allowed to react. At equilibrium, it was found that 60% of  $\text{SO}_2$  is used up. If the partial pressure of the equilibrium mixture is one atmosphere. the partial pressure of  $\text{O}_2$  is
- (A) 0.21 atm                      (B) 0.41 atm                      (C) 0.82 atm                      (D) 0.52 atm
82.  $50 \text{ cm}^3$  of 0.2 N HCl is titrated against 0.1 N NaOH solution. The titration is discontinued after adding  $50 \text{ cm}^3$  of NaOH. The remaining titration is completed by adding 0.5 N KOH. The volume of KOH required for completing the titration is
- (A)  $10 \text{ cm}^3$                       (B)  $12 \text{ cm}^3$                       (C)  $10.5 \text{ cm}^3$                       (D)  $25 \text{ cm}^3$
83. Which one of these is NOT TRUE for benzene?
- (A) It forms only one type of monosubstituted product  
(B) There are three carbon-carbon single bonds and three carbon-carbon double bonds  
(C) Heat of hydrogenation of benzene is less than the theoretical value  
(D) The bond angle between carbon-carbon bonds is  $120^\circ$
84. Which one of the following is paramagnetic?
- (A)  $\text{N}_2$                       (B) NO                      (C) CO                      (D)  $\text{O}_3$

85. Which one of the following is a covalent crystal?  
 (A) Ice (B) Rock salt (C) Dry ice (D) Quartz
86. Which one of the following DOES NOT involve coagulation?  
 (A) Formation of delta region  
 (B) Clotting of blood by the use of ferric chloride  
 (C) Peptization  
 (D) Treatment of drinking water by potash alum
87. Which one is not a constituent of nucleic acid?  
 (A) Uracil (B) Guanidine  
 (C) Phosphoric acid (D) Ribose sugar
88. A body of mass 10 mg is moving with a velocity of  $100 \text{ ms}^{-1}$ . The wavelength of de-Broglie wave associated with it would be  
 (Note :  $h = 6.63 \times 10^{-34} \text{ Js}$ )  
 (A)  $6.63 \times 10^{-37} \text{ m}$  (B)  $6.63 \times 10^{-31} \text{ m}$   
 (C)  $6.63 \times 10^{-34} \text{ m}$  (D)  $6.63 \times 10^{-35} \text{ m}$
89. A body of mass  $x \text{ kg}$  is moving with a velocity of  $100 \text{ ms}^{-1}$ . Its de Broglie wavelength is  $6.62 \times 10^{-35} \text{ m}$ . Hence  $x$  is ( $h = 6.62 \times 10^{-34} \text{ Js}$ )  
 (A) 0.15 kg (B) 0.2 kg (C) 0.1 kg (D) 0.25 kg
90. A buffer solution contains 0.1 mole of sodium acetate dissolved in  $1000 \text{ cm}^3$  of 0.1 M acetic acid. To the above buffer solution, 0.1 mole of sodium acetate is further added and dissolved. The pH of the resulting buffer is equal to  
 (A) pKa (B)  $\text{pKa} - \text{Log}2$  (C)  $\text{pKa} + \text{Log}2$  (D)  $\text{pKa} + 2$
91. A buffer solution is prepared in which the concentration of  $\text{NH}_3$  is 0.30 M and the concentration of  $\text{NH}_4^+$  is 0.20 M. If the equilibrium constant,  $K_b$  for  $\text{NH}_3$  equals  $1.8 \times 10^{-5}$ , what is the pH of this solution?  
 (A) 8.73 (B) 9.08 (C) 9.43 (D) 11.72
92. A complex compound in which the oxidation number of a metal is zero is  
 (A)  $\text{K}_4 [\text{Fe} (\text{CN})_6]$  (B)  $\text{K}_3 [\text{Fe} (\text{CN})_6]$   
 (C)  $[\text{Ni} (\text{CO})_4]$  (D)  $[\text{Pt} (\text{NH}_3)_4] \text{Cl}_2$

93. Which of the following is used to prepare  $\text{Cl}_2$  gas at room temperature from concentrated  $\text{HCl}$ ?
- (A)  $\text{MnO}_2$             (B)  $\text{H}_2\text{S}$             (C)  $\text{KMnO}_4$             (D)  $\text{Cr}_2\text{O}_3$
94. Which of the following is not an ore of magnesium?
- (A) Carnallite            (B) Dolomite            (C) Calamine            (D) Sea water
95. Which of the following has the highest bond order?
- (A)  $\text{N}_2$             (B)  $\text{O}_2$             (C)  $\text{He}_2$             (D)  $\text{H}_2$
96. Which of the following gives an aldehyde on dry distillation?
- (A) Calcium acetate + calcium benzoate    (B) Calcium formate + calcium acetate  
(C) Calcium benzoate            (D) Calcium acetate
97. Which of the following does not give benzoic acid on hydrolysis?
- (A) phenyl cyanide            (B) benzoyl chloride  
(C) benzyl chloride            (D) methyl benzoate
98. 80 g of oxygen contains as many atoms as in
- (A) 80 g of hydrogen            (B) 1 g of hydrogen  
(C) 10 g of hydrogen            (D) 5 g of hydrogen
99. 9.65 C of electric current is passed through fused anhydrous magnesium chloride. The magnesium metal thus obtained is completely converted into a Grignard reagent. The number of moles of the Grignard reagent obtained is
- (A)  $1 \times 10^{-4}$             (B)  $5 \times 10^{-4}$             (C)  $1 \times 10^{-5}$             (D)  $5 \times 10^{-5}$
100. A 6% solution of urea is isotonic with
- (A) 6% solution of Glucose            (B) 25% solution of Glucose  
(C) 1 M solution of Glucose            (D) 0.05 M solution of Glucose