ENTRANCE EXAMINATION FOR ADMISSION, MAY 2012.
Ph.D. (ENVIRONMENTAL TECHNOLOGY)

COURSE CODE : 112

Register Number : 

Signature of the Invigilator
(with date)

COURSE CODE : 112

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.
1. The ‘Absolute zero’ is equivalent to
   (A) $-273^\circ \text{C}$  (B) $+273^\circ \text{C}$  (C) $300^\circ \text{C}$  (D) $373^\circ \text{C}$

2. Helium belongs to the group of
   (A) Real gas  (B) Inert gas  (C) Ideal gas  (D) Fuel gas

3. The BOD of a water sample is $200 \text{ mg l}^{-1}$. Its COD is likely to be
   (A) 160  (B) 180  (C) 190  (D) 240

4. Lignite is a low grade coal found in
   (A) Gujarat  (B) U.P.  (C) Tamil Nadu  (D) Karnataka

5. Which of these gases belongs to CFC class of compounds?
   (A) Carbon tetrachloride  (B) Chloroform
   (C) Hydrogen fluoride  (D) Freon

6. The most efficient capture of air borne particulates occurs in
   (A) Ventury scrubber  (B) Gravitational settling chamber
   (C) Electrostatic precipitator  (D) Cyclone

7. Which of the following parameters reflect the capacity of a water-body to sustain life?
   (A) Hardness  (B) Acidity
   (C) Alkalinity  (D) Dissolved oxygen

8. Which gas is commonly used for disinfection in municipal water supply?
   (A) Bromine  (B) Hydrogen  (C) Chlorine  (D) Oxygen

9. Binominal nomenclature of scientific names was introduced by
   (A) Linnaeus  (B) Cassias  (C) Claudias  (D) Darwin

10. Environment day is celebrated each year on
    (A) 5$^{th}$ December  (B) 5$^{th}$ June  (C) 23$^{rd}$ February  (D) 20$^{th}$ July
11. An element has an atomic wt. 23 and atomic number 11. What will be the number of neutrons present in it?
   (A) 12      (B) 23      (C) 11      (D) 34

12. In which reactor the concentration of reactants is the same at all points in the reactor?
   (A) Fluidized bed reactor          (B) CSTR
   (C) Plug-flow reactor              (D) Expanded bed reactor

13. A water sample which does not form lather with soap immediately, is defined as
   (A) hard       (B) soft      (C) acidic       (D) alkaline

14. An _______ is used to denote the end-point of a titration
   (A) catalyst    (B) indicator   (C) reagent    (D) acid

15. Composting is essentially a
   (A) Aerobic process          (B) Anaerobic process
   (C) Chemical process         (D) Toxic process

16. The flame photometer is best suited for the determination of
   (A) Lead      (B) Zinc       (C) Sodium      (D) Iron

17. Which of these metals contribute to the hardness of a water sample?
   (A) Phosphorous (B) Sodium      (C) Potassium    (D) Calcium

18. Deuterium is an isotope of
   (A) hydrogen    (B) oxygen     (C) radium     (D) carbon

19. Which of the following contribute to air pollution in big cities?
   (A) Vehicular emissions       (B) Industries
   (C) Burning of waste materials   (D) All of the above

20. A diagram depicting wind speeds and directions at a point is called
   (A) Wind petel      (B) Wind flower   (C) Wind rose    (D) Wind shield
21. During composting nitrogen-to-carbon ratio gradually increases because

(A) A part of the Carbon is lost as bacterial respiration
(B) Nitrogen is sucked in form atmosphere by the bacteria
(C) There is photosynthesis
(D) There is anaerobic fermentation

22. A ______ is used to increase the speed of a chemical reaction

(A) reagent  (B) catalyst  (C) inhibitor  (D) indicator

23. Name the substance commonly found in antiseptic preparations

(A) iodine  (B) chlorine  (C) sodium  (D) potassium

24. The probability of a cricket captain winning the toss is

(A) 25%  (B) 50%  (C) 75%  (D) 100%

25. What is meant by the term 'hygroscopic'?

(A) absorbs moisture  (B) absorbs hydrogen
(C) gives off moisture  (D) gives off hydrogen

26. Presence of ________ in polluted air accelerates the corrosion of metals

(A) CO₂  (B) SO₂  (C) CO  (D) NH₄

27. Natural gas consists chiefly of

(A) methane  (B) arsenic  (C) stilbene  (D) astentine

28. Which of the following is a 'green house gas'?

(A) O₂  (B) N₂  (C) CO₂  (D) H₂

29. When oxygen in the tissue becomes inadequate, the condition is called

(A) dyspnoea  (B) asphyxia  (C) hypoxia  (D) anoxia

30. The differential coefficient of the function f(x) = x³ is

(A) 3x  (B) 2x³  (C) 3x²  (D) x⁴
31. Alumina is
   (A) Aluminium sulphate          (B) Aluminium sulphite
   (C) Aluminium nitrate           (D) Aluminium oxide

32. “Ozone hole” is caused by
   (A) Oxygen                      (B) Chlorine
   (C) Chlorofluorocarbons         (D) Nitrogen

33. Name a simple method for removing temporary hardness of a water sample
   (A) Cooling                     (B) Boiling            (C) Filtration   (D) Evaporation

34. Among the following which one is not a source of biomass energy
   (A) Municipal waste             (B) Coal
   (C) Biogas                      (D) Agricultural residues

35. Radioisotopes are used in the treatment of
   (A) Cancer                      (B) Jaundice          (C) Night blindness  (D) Typhoid

36. Which one of the following gases in implicated with greenhouse effect?
   (A) Chlorine                    (B) Fluorine          (C) Ozone           (D) Methane

37. When water is electrolyzed, the products are
   (A) H₂ and O₂                   (B) O₂ and N₂         (C) NH₃ and H₂       (D) NO₂ and H₂

38. Incineration of municipal solid waste releases which toxic material of most serious concern
   (A) methyl mercury              (B) dioxins           (C) heptachlor       (D) all the above

39. Name the gas present in aerated drinks like soda water
   (A) O₂                          (B) H₂              (C) CO₂             (D) N₂

40. Which among the following is a ‘primary standard’?
   (A) HCl                         (B) H₂SO₄            (C) Na₂CO₃           (D) NaOH
41. Bacteria in milk are killed by the process called
   (A) fermentation      (B) freezing
   (C) preservation      (D) pasteurization

42. Which of the following is not a greenhouse gas?
   (A) Carbon dioxide    (B) Water vapor  (C) Methane  (D) Hydrogen

43. The most favourable habitat of a plant is called
   (A) Ecological system (B) Ecological habitat
   (C) Ecological type   (D) Ecological niche

44. Who among the following was associated with 'chipko movement'?
   (A) Medha Patkar      (B) Sunita Narayan
   (C) Sunderlal Bahuguna (D) Arundhati Roy

45. Which of the following ‘pollutant’ can cause eutrophication in a water body?
   (A) Mercury          (B) Copper     (C) Iron       (D) Phosphorous

46. BOD level of a water sample is indicative of
   (A) Concentration of pathogens (B) Concentration of organic matter
   (C) Concentration of trace elements (D) Concentration of facultative bacteria

47. An ‘ammeter’ is used for measurement of
   (A) current           (B) voltage    (C) power     (D) noise

48. Name the metal does not which exhibit radioactivity
   (A) Rubidium          (B) Rhodium
   (C) Tantalum          (D) None of the above

49. LPG consists of mostly
   (A) methane + propane (B) propane + acetylene
   (C) acetylene + butane (D) butane + propane

50. ‘Vermicomposting’ employs ______ for bio-degradation of waste
   (A) Insects          (B) Annelids  (C) Amphibians  (D) Fishes
51. Which of these metals contribute to toxicity in the aquatic environment?
   (A) Na     (B) Ca     (C) Hg     (D) K

52. Insulin is produced by
   (A) liver   (B) stomach  (C) pancreas  (D) gall bladder

53. Trees planted on the top of landfill sites often die even when there is thick layer of soil on top, the reason for this is
   (A) toxicity of leachate
   (B) heavy metal ions coming to the top of landfill
   (C) toxicity of gases coming to the top
   (D) all the above

54. Penicillin was discovered by
   (A) Pasteur   (B) Edward Jenner
   (C) Fleming   (D) Ehrlich

55. The factor most responsible for soil erosion is
   (A) Wind     (B) Deforestation  (C) Overgrazing  (D) Rain

56. A luxmeter is used for measurement of
   (A) cleanliness  (B) sound  (C) sunlight  (D) power

57. Which one among the following is not a method of air pollution control at source?
   (A) Raw materials changes  (B) Scrubbing of flue gases
   (C) Change in process     (D) Modification in equipments

58. When B.O.D of a water-body is high, how does it affect its D.O.?
   (A) D.O. increases  (B) D.O. decreases
   (C) D.O. remains the same  (D) No relationship

59. High volume sampler is used to measure
   (A) Particles in air  (B) Pollutants in water
   (C) Both  (D) None
60. The presence of pesticides in drinking water and colas was brought to public attention by

(A) Sunita Narayan  (B) Amartya Sen
(C) Sir Vidhyadhar Naipaul  (D) Vandana Shiva

61. The place or physical space occupied by an organism in an ecosystem is called

(A) Niche  (B) Habit  (C) Home  (D) All the above

62. The ozone layer in the atmosphere is essential as

(A) it blocks sun-light  (B) it blocks the harmful UV radiation
(C) it increases the oxygen supply  (D) it reduces microbes

63. When the concentration of ionized substances in a water sample increases, its specific conductance

(A) Increases  (B) Decreases
(C) Remains constant  (D) No specific relation

64. Aqua regia is a mixture of 1 volume part of ____________and 3 volume parts of ____________

(A) hydrochloric acid, nitric acid  (B) hydrochloric acid, sulphuric acid
(C) nitric acid, hydrochloric acid  (D) sulphuric acid, hydrochloric acid

65. Sediments are mostly deposited by

(A) Landslides  (B) Rivers  (C) Glaciers  (D) Sea waves

66. 'Acid rain' is caused by the presence in air of high concentration of

(A) Sulphur oxides  (B) Dust particles  (C) CO  (D) CO₂

67. Richter scale measures

(A) wind intensity  (B) earthquake intensity
(C) wave intensity  (D) tide intensity

68. PCR refers to

(A) Polymerase chain reaction  (B) Pollution control reactions
(C) Polymerized chain reactions  (D) None of the above
69. High volume sampler is used in
   (A) Ambient air quality monitoring  (B) Water quality monitoring
   (C) Soil testing  (D) Effluent analysis

70. The presence of excess fluoride in ground water leads to
   (A) cataract  (B) skeletal deformity
   (C) dementia  (D) arthritis

71. The dose or number of organisms that will kill 50% of an experimental group of hosts
    within a specified time period is
   (A) LC 50  (B) LD 50  (C) ID 50  (D) All the above

72. ATP is
   (A) adenine triphosphate  (B) adenosine triphosphate
   (C) arginine triphosphate  (D) aldehyde triphosphate

73. The instrument used for assessing ionic strength of a water sample is known as
   (A) Conductivity meter  (B) pH meter
   (C) Turbidimeter  (D) Photometer

74. Who among the following was associated, with 'Narmada Bachao Andolan'?
   (A) Sunderlal Bahuguna  (B) Medha Patkar
   (C) Sunita Narayan  (D) Salman Rushdie

75. Reduction of nitrate and nitrite to gaseous products such as nitrous oxide and
    molecular nitrogen is referred to as
   (A) Nitrification  (B) Denitrification
   (C) Ammonification  (D) Sublimation

76. The biological oxygen demand (BOD) is usually estimated in how many days
   (A) 2  (B) 3  (C) 5  (D) 4

77. Which one among the following is generally the best way to extract energy from
    biomass having a high moisture content?
   (A) Combustion  (B) Gasification
   (C) Pyrolysis  (D) Anaerobic digestion
78. Goitre is caused due to the deficiency of
   (A) Calcium   (B) Magnesium   (C) Iodine   (D) Iron

79. Microscope’s capability to deliver a visible image with clear details is called
   (A) magnification   (B) magnitude   (C) focal length   (D) resolution

80. The causative agent for malaria is
   (A) Male mosquito   (B) Dead mosquito
   (C) Female mosquito   (D) None

81. Brown ring test is done to detect the presence of
   (A) nitrite   (B) sulphate   (C) nitrate   (D) chloride

82. Ozone is used in water purification systems for
   (A) sedimentation   (B) disinfection
   (C) irradiation   (D) removal of impurities

83. The pH of a water sample is 2. This indicates that the sample is
   (A) Acidic   (B) Basic
   (C) Neutral   (D) None of the above

84. Which is a unit used for measuring sound?
   (A) Hertz   (B) Ohms   (C) Siemens   (D) Decibel

85. If sewage is released into a lake, what is the effect on its B.O.D?
   (A) Increases   (B) Decreases
   (C) No change   (D) None of the above

86. An instrument used for sterilization of culture media is
   (A) incubator   (B) autoclave
   (C) hot air oven   (D) centrifuge
87. ___________ is a carcinogenic environment pollutant
   (A) CO₂  (B) H₂
   (C) N₂  (D) Tobacco smoke

88. Which of the following is a free-floating aquatic weed?
   (A) Hydrilla verticillata  (B) Macrocystis perифyra
   (C) Salvinia molesta  (D) Ipomea aquatic

89. Examples of free floating hydrophytes are (i) Eichhornia (ii) Salvinia (iii) Pistia (iv) Nymphaea
   (A) i and ii  (B) i and iii  (C) ii and iv  (D) all

90. If log x = S, then 2 S is equal to
   (A) log x²  (B) log x³  (C) log (2+x)  (D) log (2x)

91. Organic substances that are essential to life but not required as energy sources
   (A) proteins  (B) fats
   (C) carbohydrates  (D) vitamins

92. Which of the following is a heavy metal?
   (A) Magnesium  (B) Potassium  (C) Zinc  (D) Selenium

93. Which is a consequence of global warming?
   (A) rise in sea-level  (B) acid rain
   (C) ozone hole  (D) tsunami

94. Deficiency of vitamin C causes
   (A) rickets  (B) scurvy  (C) goiter  (D) diabetes
95. **NEERI stands for**
   (A) National Environmental Engineering Research Institute
   (B) National Environment & Ecological Research Institute
   (C) National Ecological & Environmental Research Institute
   (D) National Environmental Education Research Institute

96. **In the field of environmental analysis, AAS is the acronym for**
   (A) Atomic absorption spectrometry
   (B) Advance atomization system
   (C) Advanced analytical spectroscopy
   (D) Alternative analytical solutions

97. **Turbidity of water at different depths is assessed by a**
   (A) Scechhi disc
   (B) Turbid disc
   (C) Lut photometer
   (D) All the above

98. **Anemia is caused by the fall in **_________** content of the blood**
   (A) blood plasma  (B) iron  (C) insulin  (D) blood sugar

99. **Bile is secreted by**
   (A) Liver  (B) Lungs  (C) Pancreas  (D) Intestine

100. **Which of these is a secondary air pollutant?**
    (A) Nitrogen
    (B) Sulphur dioxide
    (C) Ozone
    (D) Hydrogen