

ENTRANCE EXAMINATION FOR ADMISSION, MAY 2011.

M.Phil./Ph.D. (ENVIRONMENTAL TECHNOLOGY)

COURSE CODE : 248/112

Register Number :

Signature of the Invigilator
(with date)

COURSE CODE : 248/112

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 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. Screening is a part of the following stage of wastewater treatment
(A) Primary treatment (B) Secondary treatment
(C) Tertiary treatment (D) Reverse treatment
2. Reaction vessels that are subjected to identical procedures as the samples in a given batch, but have no sample added are called
(A) Duplicates (B) Batch mode
(C) Blanks (D) Borosil vessels
3. Newton is the SI unit of
(A) pressure (B) force
(C) work (D) energy
4. The units of radioactivity are (i) Curie (ii) Rutherford (iii) Roentgen (iv) Joule
(A) (i) (ii), (iii) only (B) (i) & (iii) only
(C) (ii) & (iv) only (D) all
5. Plastic is considered an environmental hazard because it is
(A) durable (B) flexible
(C) transparent (D) non-biodegradable
6. Frequent formation of algal blooms in a lake indicates
(A) Lack of herbivores (B) Lack of carnivores
(C) Nutrient deficiency (D) Nutrient enrichment
7. "Silent Spring" is a famous name in the history of environmental awareness. It Represents
(A) A song (B) A painting
(C) A person (D) A book
8. Of the following, which category of animals face highest possibility of extinction?
(A) Threatened (B) Endangered
(C) Vulnerable (D) Rare
9. The greatest risk to humans due to ozone hole is
(A) AIDS (B) Infertility
(C) Deformity (D) Skin cancer

10. Which of the following atoms form cations : (i) K (ii) Ca (iii) Na (iv) La
(A) (i) (ii) & (iii) only (B) (ii) & (iii) only
(C) All (D) (i) & (ii) only
11. Photochemical smog formation in urban area is mainly due to the presence in the atmosphere of
(A) Ozone, PAN and Nitrogen dioxide
(B) Fog and smoke
(C) Particulates and fog
(D) Winter climate and high humidity
12. Study of life of past ages is
(A) Pedology (B) Genecology
(C) Paleontology (D) Ethnology
13. During ambient air quality monitoring, normally the flow-rate through the high volume air sampler is maintained at
(A) $1.7\text{m}^3/\text{min}$ (B) $6.3\text{m}^3/\text{min}$
(C) $17\text{m}^3/\text{min}$ (D) $20.2\text{m}^3/\text{min}$
14. Which one is a proven carcinogen?
(A) Lignin (B) Methanol
(C) Vinyl chloride (D) Acetic acid
15. A blood protein present in the plasma involved in clotting.
(A) Plasminogen (B) Glycogen
(C) Fibrinogen (D) Elastogen
16. Symbiotic nitrogen fixation is undertaken by
(A) Usnea (B) Rhizobium
(C) Chlorella (D) Volvox
17. Global warming will not cause
(A) Rise in sea level (B) Extinction of some species
(C) Change in weather (D) AIDS

18. Organism that absorb nutrients from dead tissues are called
(A) bulk-feeders (B) phototrophs
(C) saprophytes (D) chemotrophs
19. 'Chipko Movement' was started in which area?
(A) Narmada valley (B) Rajasthan desert
(C) Western ghats jungles (D) Garhwal Himalayas
20. Carnivorous plants fulfill the requirement of which element by carnivory?
(A) S (B) N
(C) B (D) P
21. In India the most commonly used method for sewage treatment is
(A) Oxidation ponds (B) Trickling filters
(C) Rotating biological contractor (D) Activated sludge process
22. Compounds that have the same molecular formula but different structural formulae are called
(A) polymers (B) monomers
(C) isomers (D) isotopes
23. The ambient air is stable when the ambient lapse rate is
(A) Subadiabtic (B) Superadiabatic
(C) Neutrally stable (D) Hyperadiabatic
24. The sum total of DNA that a cell contain is the
(A) Gene (B) Genome
(C) All (D) Chromosome
25. The science of improving the human race by improving environment is termed as
(A) Euthenics (B) Eugenics
(C) Environmental biotechnology (D) None
26. UV radiation can cause
(A) Low Bp (B) Respiratory illness
(C) Skin cancer (D) Arthritis

27. Limestone is
(A) Mg SO_4 (B) Ca SO_4
(C) $\text{Na}_2 \text{CO}_3$ (D) Ca CO_3
28. Which of the following is the commonly used indicator for the presence of pathogens in water?
(A) algae (B) coliforms
(C) protozoa (D) amoeba
29. Which of these is a 'primary air pollutant?'
(A) Oxygen (B) Hydrogen
(C) Nitrogen (D) Sulphur dioxide
30. Which one among the following is the most common indoor air pollutant in India?
(A) Ozone (B) Radon
(C) Formaldehyde (D) CO
31. Plants that grow on saline soils are called
(A) xerophytes (B) hydrophytes
(C) psammophytes (D) halophytes
32. 'Survival of the fittest' was put forth by
(A) Lamarck (B) Darwin
(C) De vries (D) Roentgen
33. Rapid mixing and dilution of pollutants in the atmosphere will occur when
(A) actual air temperature drops slower than the adiabatic lapse rate
(B) actual air temperature drops faster than the adiabatic lapse rate
(C) actual air temperature drops at the rate of adiabatic lapse rate
(D) an inversion layer covers the area.
34. Which of the following is not used for disinfection of water?
(A) Chlorine (B) Potassium permanganate
(C) Sodium chloride (D) Iodine
35. Gases react in the ratio of their volumes. This is called
(A) Gay-Lussac's law (B) Charle's law
(C) Henery's law (D) Boyle's law

36. Dissolved oxygen is removed from boiler feed water to prevent
(A) Growth of microorganisms (B) Corrosion of metal
(C) Formation of bubbles (D) Loss in boiler efficiency
37. A disease which may be prevented by wearing shoes is caused by:
(A) tapeworm (B) scaly worm
(C) trichina worm (D) hookworm
38. The substance responsible for the 'Minimata' disaster was
(A) Copper (B) Chromium (C) Mercury (D) Zinc
39. The prescribed Indian Standard method for estimating Nitrogen Oxides uses solution of which compound as absorbing reagent
(A) Hydrogen Peroxide (B) Sodium sulphate
(C) Sulphurous acid (D) Dichlorosulphitomercurate
40. In the field of pollution control ASP stands for
(A) Active scale prevention (B) Activated sludge process
(C) Alternative sludge production (D) Ammonia stripping polarimetry
41. In the Ammonia stripping method of Nitrogen removal the pH of wastewater should be more than
(A) 5 (B) 7 (C) 8 (D) 10
42. The median of 1,2,3,4,5 is
(A) 1 (B) 2 (C) 3 (D) 4
43. _____ is used for measuring conductivity of a solution
(A) Conductometer (B) Coulometer
(C) Ammeter (D) Nanometer
44. Process in which a species slowly or rapidly becomes better suited to survive is
(A) adoption (B) adaptation
(C) variation (D) addiction
45. Fine bubble air diffusers are used in
(A) Trickling filter (B) Activated sludge process
(C) Rotating biological contactor (D) Oxidation pond

46. Vehicular traffic introduces which of the following pollutant in the environment
(A) E. Coli (B) Ozone (C) Lead (D) Heptachlor
47. Peptide bonds are present in
(A) amino acid (B) glucose (C) fatty acid (D) lactic acid
48. Which of the following are examples of light microscope?
(A) phase-contrast (B) fluorescence
(C) dark field (D) all the above
49. Human beings have ————— homologous pairs of chromosomes
(A) 23 (B) 46 (C) 43 (D) 26
50. Montreal protocol was signed for the control of
(A) Mercury pollution (B) Greenhouse effect
(C) Ozone hole (D) Great-lake pollution
51. Composting is essentially a
(A) Aerobic process (B) Anaerobic process
(C) Chemical process (D) Toxic process
52. In a relation between two individuals, the individual which receives benefit at the expense of other individual is called
(A) host (B) parasite (C) predator (D) prey
53. Measurement of pH is based on
(A) Coulometry (B) Cibductometry
(C) Nephaleometry (D) Potentiometry
54. 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
55. Name the gas which is used in fire extinguisher?
(A) O₂ (B) N₂ (C) Cl₂ (D) CO₂

56. The metal sodium imparts which colour to a flame
(A) orange (B) golden yellow
(C) blue (D) green
57. Adsorption is a
(A) Purely surface phenomena (B) Purely internal phenomena
(C) Purely biological phenomena (D) Purely arbitrary phenomena
58. What is the pH of 0.001 M NaOH solution?
(A) 3 (B) 2 (C) 11 (D) 8
59. Foreign proteins that set off a defense reaction in the host are known as
(A) antigen (B) antibody
(C) interferon (D) phagocytes
60. 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
61. The work of IPCC has its focus on :
(A) Global warming (B) Ozone hole
(C) Acid rain (D) Tsunami
62. The estimation of dissolved oxygen by the titrimetric method involves
(A) Acid-base titration (B) Precipitation
(C) Iodimetric titration (D) Compleximetric titration
63. The BOD of a water sample is 200 mg l^{-1} . Its COD is likely to be
(A) 160 (B) 180 (C) 190 (D) 240
64. Amalgamation is a process for extracting metals from their ores by dissolving them in
(A) sulphuric acid (B) mercury
(C) nitric acid (D) hydrochloric acid
65. Over-exploitation of ground water resources in coastal areas leads to
(A) Floods (B) Earthquake
(C) Tsunami (D) Sea water intrusion

66. The probability of a cricket captain winning the toss is
(A) 25% (B) 50% (C) 75% (D) 100%
67. A disease caused by the deficiency of vitamin D is
(A) Beriberi (B) Night blindness
(C) Scurvy (D) Rickets
68. The most commonly present metal in tannery effluents is
(A) Mercury (B) Calcium (C) Chromium (D) Arsenic
69. The electrical conductivity of a water sample is indicative of its
(A) suspended solids (B) dissolved solids
(C) biological solids (D) volatile solids
70. Which of the following is the most environment-friendly fabric?
(A) Nylon (B) Terelene (C) Wool (D) Polythene
71. Photosynthesis takes place in the epilimnion of the lakes because:
(A) It is the zone of light penetration
(B) It has the maximum nutrient availability
(C) It has the largest number of herbivores
(D) It has high population of carnivores
72. The ideal reactor to which a trickling filter most closely approximates is:
(A) A batch reactor (B) A plug flow reactor
(C) A CSTR (D) A fluidized bed reactor
73. High albedo means
(A) high degree of reflection of sunlight
(B) high degree of absorption of sunlight
(C) high degree of polarization of sunlight
(D) high degree of resolution of sunlight
74. Which vitamin is abundant in lemon?
(A) Vitamin A (B) Vitamin B (C) Vitamin C (D) Vitamin D
75. Which of the following values of HRT represents the fastest reactor?
(A) 4 hour (B) 3 hour (C) 2 hour (D) 1 hour

76. Anaerobic bacteria are so called because
(A) They can't survive without free oxygen
(B) They can't survive with free oxygen
(C) They can't survive in cold climate
(D) They can't react with water
77. The metal which is present in the pigment chlorophyll present in plants
(A) Ni (B) Zn (C) Fe (D) Mg
78. Nitrification is a process in which
(A) Ammonia is converted to Nitrate (B) Ammonia is converted into nitrogen
(C) nitrogen is converted into Ammonia (D) Nitrate is converted into Ammonia
79. An anemometer is used for measurement of
(A) sound (B) rain
(C) current (D) wind velocity
80. Which of the following is a product of anaerobic digestion of biomass?
(A) HCL (B) CH₄ (C) N₂ (D) O₂
81. Gentrification is a process in which
(A) Nitrite is converted into Nitrogen gas
(B) Nitrate is converted into Ammonia gas
(C) Nitrate is converted into N₂O and NO gases
(D) Ammonia is converted into N₂ gas
82. Which of the following is a pollutant present in automobile exhaust fumes?
(A) Ca (B) Na (C) Pb (D) K
83. Microaerophiles are microbes that grow best when
(A) Oxygen is present in low concentration (B) Oxygen is absent
(C) Anaerobic conditions (D) All the above
84. Hardness in water is due to
(A) monovalent anions (B) monovalent cations
(C) divalent anions (D) divalent cations

85. Which equipment releases ozone gas?
- (A) Refrigerator (B) Gas stove
(C) Photocopier (D) Microwave oven
86. "The fall of a sparrow" was written by
- (A) A.P.J. Abdul Kalam (B) Zakir Hussain
(C) Salim Ali (D) Nafeesa Ali
87. Which of the following is not used for filtering municipal water supplies?
- (A) Pressure filters (B) Rapid gravity filters
(C) Slow sand filters (D) Membrane filters
88. Phenol is less acidic than
- (A) ethanol (B) o-nitrophenol
(C) methanol (D) p-methylphenol
89. Odour in a pulp and paper industry is mostly due to the presence of
- (A) Dioxins (B) Mercaptans
(C) Ammonia (D) Sulphides
90. For a city dweller the major source of lead in body is
- (A) respiratory air (B) drinking water
(C) absorption by skin (D) food
91. Which of the following is not a component of city-level municipal solid waste management in India?
- (A) collection (B) segregation
(C) transportation (D) nitrification
92. A teratogenic pollutant is the one which causes:
- (A) Cancer (B) Mutation
(C) Colds (D) Fever
93. Aerosols are
- (A) Small solid particles suspended in air
(B) Small liquid particles suspended in air
(C) Smoke particles floating in the atmosphere
(D) Small liquid or solid particles that remain suspended in the air

94. The December 2004 Tsunami was caused by
(A) Global warming (B) Ozone hole
(C) Earth quake (D) Hurricane
95. Animal starch is stored in the liver in the form of
(A) glycogen (B) glucose
(C) sucrose (D) lactogen
96. What is the disadvantage in using electrostatic precipitators for air pollution control?
(A) small particles can't be removed (B) high pressure drop
(C) problem in handling hot gases (D) high initial cost
97. Cholera is caused by
(A) *Vibrio choleri* (B) *Salmonella choleri*
(C) *Cholera choleri* (D) *Escherichia coli*
98. The distance between celestial bodies is measured in which unit?
(A) solar year (B) solar day
(C) light year (D) light day
99. Which of the following is a 'toxic' gas?
(A) O_2 (B) H_2
(C) N_2 (D) Cl_2
100. If x is the logarithm of a to the base b , then it implies that
(A) $ax = b$ (B) $bx = a$
(C) $xa = b$ (D) $ba = x$
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