

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU  
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**A**

**SET-Y**

**PHD/URS-EE-DEC-2022**

**SUBJECT : Environmental Sciences**

**10097**

Sr. No. ....

Time : 1¼ Hours

Max. Marks : 100

Total Questions : 100

Roll No. (in figures) \_\_\_\_\_ (in words) \_\_\_\_\_

Name \_\_\_\_\_ Date of Birth \_\_\_\_\_

Father's Name \_\_\_\_\_ Mother's Name \_\_\_\_\_

Date of Examination \_\_\_\_\_

\_\_\_\_\_  
(Signature of the Candidate)

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**PHD/URS-EE-2022/(Environmental Sciences)(SET-Y)/(A)**

1. Public hearing is mandatory for project like :
  - (1) Mining project
  - (2) River valley project
  - (3) Oil refinery project
  - (4) All of the above
  
2. "Cool global climate" effect in the Earth's atmosphere is due to :
  - (1) Sulphate Aerosol
  - (2) Nitrate Aerosol
  - (3) Oxide Aerosol
  - (4) None of the above
  
3. Mudflow of a slurry of Pyroclastic material of rocks and water from a volcano along with river valley ?
  - (1) Mudflow
  - (2) Avalanches
  - (3) Lahars
  - (4) Solifluction
  
4. Trans-boundary movement of hazardous waste and disposal was adopted in year 1989 is called ?
  - (1) Basel convention
  - (2) Montreal protocol
  - (3) Convention on Biological diversity
  - (4) All of the above
  
5. Recently Government announced "Indian Biological Data Centre" in which district of Haryana ?
  - (1) Gurugram
  - (2) Faridabad
  - (3) Rewari
  - (4) Panchkula

6. Leopold developed Interaction matrix which contains how many parameters ?
- (1) 90 (2) 100  
(3) 30 (4) 120
7. Which Microwave band in remote sensing is suitable for "Height measurement of trees" ?
- (1) C (2) X  
(3) S (4) L
8. Which statement is *correct* about Los Angeles smog is ?
- (1) Oxidizing nature  
(2) Due to PAN and Ozone  
(3) Both (1) and (2)  
(4) None of the above
9. Predator-prey relation in biological system is mainly explained by ?
- (1) Lotka-Volterra equation  
(2) Box model  
(3) Lefkovitch matrix  
(4) Leslies matrix model
10. The Harmonic mean of the numbers 10, 15 and 30 :
- (1) 20 (2) 15  
(3) 40 (4) 10

11. How many wetland sites of India are in Montreux record ?  
(1) 1 (2) 3  
(3) 10 (4) 2
12. Which of the following is an Organochlorine insecticide ?  
(1) Aldrin (2) Chlordane  
(3) Endosulfan (4) All of the above
13. Which Gas is predominantly released during initial stage of Landfill ?  
(1)  $\text{CH}_4$  (2)  $\text{NH}_3$   
(3)  $\text{CO}_2$  (4)  $\text{H}_2\text{S}$
14. As "Eco-mark" is the Ecolabel of India. Which of the following is Eco label of USA ?  
(1) Green Seal (2) Blue Angle  
(3) Eco Garantie (4) None of the above
15. Match the following :
- | List-I       | List-II                                     |
|--------------|---|
| a. Quartz    | i. $\text{CaMg}(\text{CO}_3)_2$             |
| b. Topaz     | ii. $\text{SiO}_2$                          |
| c. Kalsilite | iii. $\text{Al}_2\text{SiO}_4(\text{OH})_2$ |
| d. Dolomite  | iv. $\text{KAlSiO}_4$                       |
- (1) a-i, b-ii, c-iii, d-iv (2) a-ii, b-iii, c-iv, d-i  
(3) a-iv, b-iii, c-i, d-ii (4) a-iii, b-iv, c-i, d-ii

16. Most common form of Lead present in Pesticides :
- (1) PbTe (2)  $Pb(N_3)_2$   
(3)  $Pb(C_2H_3O_2)_2$  (4)  $PbHAsO_4$
17. According to heat value of coal, which is the best representation ?
- (1) Peat < Lignite < Bituminous < Anthracite  
(2) Anthracite < Bituminous < Lignite < Peat  
(3) Peat < Anthracite < Bituminous < Lignite  
(4) Anthracite < Peat < Lignite < Bituminous
18. Which is *not* the best tool to study Landscape fragmentation ?
- (1) GIS (2) Geodesy  
(3) Cartography (4) Remote Sensing
19. With the increase of rate of population growth, Doubling time :
- (1) Decrease (2) Increase  
(3) Both (1) & (2) (4) None of the above
20. CAPART stands for ?
- (1) Committee for Advancement and Privatization of Rural Technology  
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21. Compare sample variance to a theoretical population variance is called :

- (1) Z test (2) F test  
(3) Chi Square test (4) t Test

22. .... Force and ..... Force balance create the Geostrophic Winds.

- (1) Coriolis, Pressure gradient  
(2) Centripetal, Centrifugal  
(3) Frictional, Pressure gradient  
(4) Coriolis, Frictional

23. Energy flow in an ecosystem is depicted by :

- (1) Planck's law  
(2) Winkler's law  
(3) Second law of thermodynamics  
(4) First law of thermodynamics

24. In AAS, process of "Nebulisation" refers :

- (1) Sublimate the sample  
(2) Convert liquid sample into small droplets  
(3) Convert liquid sample into solid part  
(4) Convert liquid sample into gaseous form

25. Highest Bioconcentration Factor (BCF) is :
- (1) DDT (2) Heptachlor  
(3) Eldrin (4) DDE
26. World Ozone Day celebrated on :
- (1) 16 September (2) 5 June  
(3) 16 October (4) 5 July
27. UN Decade of Ocean Science for Sustainable Development is :
- (1) 2011-2020 (2) 2001-2010  
(3) 2021-2030 (4) 1991-2000
28. The overall species diversity across communities within a larger geographic area is called :
- (1) Species diversity (2) Gamma diversity  
(3) Alpha diversity (4) Beta diversity
29. For detection of presence of  $\text{SO}_2$  and HF in air, which is used as plant Indicator ?
- (1) Lichen (2) Blue green algae  
(3) Red algae (4) Orchid
30. Which is used in the Nalgonda technique of fluoride removal ?
- (1) Potassium Salts (2) Sulphur Salts  
(3) Zinc Salts (4) Aluminium Salts

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31. Chemical Formula of CFC-12 is :

- (1)  $\text{CFCl}_3$  (2)  $\text{CF}_2\text{Cl}_2$   
(3)  $\text{CHFCl}_2$  (4)  $\text{CHCl}_3$

32. Satellite used for measuring precipitation TRMM called as :

- (1) Trans Rainfall measuring mission  
(2) Tundra Rainfall measuring mission  
(3) Tropical Rainfall measuring mission  
(4) Trans Regional measuring mission

33. In a horizontal wind turbine operated at maximum efficiency, Power is proportional to its diameter as :

- (1)  $D^2$  (2)  $D^3$   
(3)  $D^{1/2}$  (4)  $D$

34. Coriolis effect is greatest at :

- (1) West (2) East  
(3) Equator (4) Poles

35. Frankia is mainly involved in :

- (1) Ammonification (2) Nitrogen fixation  
(3) Denitrification (4) Nitrification



36. Mica minerals example are :

- |                      |                       |
|----------------------|-----------------------|
| (1) Biotite          | (2) Muscovite         |
| (3) Both (1) and (2) | (4) None of the above |

37. For acidified lakes mainly, which action is best recommended ?

- |                  |                 |
|------------------|-----------------|
| (1) Liming       | (2) Ozonation   |
| (3) Chlorination | (4) Ammoniation |

38. Best method for Ozone measurement is :

- (1) Gas Chromatography
- (2) Chemiluminescence
- (3) West and Gaeke method
- (4) Beta attenuation

39. Cost benefit analysis is performed during which stage ?

- (1) Feasibility study phase
- (2) Design phase
- (3) Maintenance phase
- (4) Implementation phase

40. CSR called as "Corporate Social Responsibility" has been made mandatory since year :

- |          |          |
|----------|----------|
| (1) 2014 | (2) 2015 |
| (3) 2017 | (4) 2019 |

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41. Which Indian Ministry is concerned with EIA ?
- (1) Ministry of Social Justice and Empowerment
  - (2) Ministry of Road Transport and Highways
  - (3) Ministry of Environment, Forest and Climate Change
  - (4) Ministry of Home Affairs
42. In a bare land, the primary succession species is :
- (1) Crustose Lichen
  - (2) Foliage Lichen
  - (3) Mosses
  - (4) Bryophyta
43. Conference of Parties 27th Organised by which country ?
- (1) United Kingdom
  - (2) USA
  - (3) India
  - (4) Egypt
44. Wind rose represents :
- (1) Statistical distribution of wind speed in scalar form
  - (2) Statistical distribution of wind velocity in vector form
  - (3) Statistical distribution of wind speeds in histograms
  - (4) None of the above
45. Arsenic caused mainly :
- (1) Mesothelioma
  - (2) Black foot disease
  - (3) Cancer
  - (4) Blue baby syndrome

46. Red tide is caused by mainly :
- (1) Blue green Algae (2) Desmides  
(3) Dianoflagillates (4) Diatoms
47. The Asia-Pacific Ministerial Conference on Disaster Risk Reduction (APMCDRR) was organised by which country ?
- (1) Brazil (2) Russia  
(3) Australia (4) India
48. Vitrification is a process used mainly for :
- (1) Immobilize nuclear waste  
(2) Dispose nuclear waste  
(3) Spread nuclear waste  
(4) Move nuclear waste
49. Hydrocarbon which is mainly emitted by plant species mainly ?
- (1) Pinene (2) Limonene  
(3) Isoprene (4) All of the above
50. SAFAR system for Air quality monitoring developed by :
- (1) IIT Roorke (2) IITM Pune  
(3) IISc Bangalore (4) IIT Delhi

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51. Which instrument used to measure total solar irradiance on a plain surface ?
- (1) Lux meter (2) Pyranometer  
(3) Pyraheliometer (4) Campbell-Stoke Recorder
52. For a given noise signal, what would be the correct order of noise indices in terms of increasing value.
- i.  $L_{10}$   
ii.  $L_{50}$   
iii.  $L_1$   
iv.  $L_{90}$
- Choose the *correct* answer from the options :
- (1)  $iv < ii < i < iii$  (2)  $iii < i < ii < iv$   
(3)  $i < ii < iii < iv$  (4)  $iv < iii < ii < i$
53. Which mercury form is most toxic in water ?
- (1)  $Hg^+$  (2)  $Hg^0$   
(3)  $Hg^-$  (4)  $H_3C - Hg^+$
54. What is the frequency of red colour and wavelength of violet colour of solar radiation ?
- (1) 526-606 THz, 579-590 nm  
(2) 400-484 THz, 380-450 nm  
(3) 668-789 THz, 450-490 nm  
(4) 526-606 THz, 450-490 nm

55. In the 'A' weighting network used in noise measurement, sounds of which of the following frequencies would require the least correction ?
- (1) 1000 Hz (2) 120 Hz  
(3) 150 Hz (4) 31.5 Hz
56. Soil humic acids are :
- (1) Soluble in acid (2) Insoluble in acid  
(3) Soluble in alkali (4) Soluble in both acid and alkali
57. Which chemical form of mercury is completely water soluble ?
- (1) Elemental mercury in liquid state  
(2) Monomethyl mercury  
(3) Elemental mercury in vapour state  
(4) Dimethyl mercury
58. Which of the following is *not* a molecular method for identification of microbial population from soil or water ?
- (1) MPN (2) rRNA sequencing  
(3) RT-PCR (4) PCR
59. What is the concentration of  $H^+$  in a solution of 0.1 N NaOH at 25°C ?
- (1)  $10^{13}$  M (2)  $10^{-13}$  M  
(3)  $10^{-14}$  M (4)  $10^{14}$  M

A

60. For wind power generation, the percentage of maximum extractable power contained in the wind is :

- (1) ~45% (2) ~62%  
(3) ~59% (4) ~37%

61. The ash content in coal used in stand-alone thermal power plants in India should not be more than :

- (1) 20% (2) 27%  
(3) 34% (4) 40%

62. Which of the following are living fossils ?

- i. Ginkgo biloba  
ii. Panthera tigris  
iii. Elephas Maximus  
iv. Latimavia

- (1) i and iv only (2) i and iii only  
(3) ii and iii only (4) ii and iv only

63. Which of the following mixture of gases can be found in biogas ?

- (1) CO, CH<sub>4</sub>, NO, N<sub>2</sub>S, H<sub>2</sub>O vapour  
(2) CO<sub>2</sub>, CH<sub>4</sub>, NH<sub>3</sub>, H<sub>2</sub>O vapour, H<sub>2</sub>S  
(3) CO<sub>2</sub>, CH<sub>4</sub>, NO, NH<sub>3</sub>  
(4) CO, CO<sub>2</sub>, H<sub>2</sub>O, NO, CH<sub>4</sub>

64. At STP, 1 ppb sulphur dioxide is equivalent to :
- (1)  $\sim 7.31 \mu \text{ gm}^{-3}$  (2)  $\sim 3.16 \mu \text{ gm}^{-3}$   
(3)  $\sim 4.52 \mu \text{ gm}^{-3}$  (4)  $\sim 2.86 \mu \text{ gm}^{-3}$
65. Who launched the "Green Belt Movement" in Kenya ?
- (1) Koichi Tanaka (2) Gehard Ertl  
(3) Wangari Maathai (4) Ryojii Noyori
66. The major product of slow pyrolysis of biomass is :
- (1) Biogas (2) Bio char  
(3)  $\text{CO}_2$  (4) CO
67. Ecotone between Fresh water and terrestrial ecosystems is known as :
- (1) Riparian Zone (2) Hyporheic Zone  
(3) Benthic Zone (4) Epilimnetic Zone
68. Hyperthermophilic microorganisms prefer temperatures in excess of :
- (1)  $45^\circ\text{C}$  (2)  $80^\circ\text{C}$   
(3)  $65^\circ\text{C}$  (4)  $70^\circ\text{C}$
69. Which species is *not* Epigeic Earthworm species ?
- (1) *Metaphire posthuma* (2) *Endrilus eugeniae*  
(3) *Eisenia Andrei* (4) *Eisenia fetida*

70. World Habitat Day is celebrated on :
- (1) 5 October (2) 22 March  
(3) 16 September (4) 21 March
71. What is the maximum period valid for granting Environmental Clearance (EC) for mining projects ?
- (1) 30 years (2) 10 years  
(3) 5 years (4) 20 years
72. Chemical composition of CFC-113 of :
- (1)  $\text{CF}_2\text{ClCFCl}_2$  (2)  $\text{CFCICFCl}_2$   
(3)  $\text{CH}_4\text{Cl}$  (4)  $\text{CF}_2\text{Cl}$
73. 1dB unit, represents the ozone layer of thickness :
- (1) 1/100 of a cm (2) 1/10 of a cm  
(3) 1/100 of a mm (4) 1/10 of a mm
74. Types of tidal power plant :
- (1) Single basin double-effect Plant  
(2) Double basin with linked-basin operation  
(3) Double basin with paired-basin operation  
(4) All of the above



75. What is the example of Nominal variable ?

- (1) Gender (2) Population  
(3) Metabolism (4) None of these

76. Who was the woman activist who initiated the Chipko Movement in Reni Village of Chamoli District in 1973 ?

- (1) Smt. Gaura Devi (2) Smt. Amrita Devi  
(3) Smt. Sunita Devi (4) Smt. Ila Bhatt

77. "La Nina" is Spanish word meaning :

- (1) The little girl  
(2) The little boy  
(3) The son of the ocean  
(4) The daughter of the ocean

78. Pollutants in the soil can be broken down by microorganisms. The process is called :

- (1) Probiotics (2) Bioremediation  
(3) Bio-augmentation (4) None of these

79. For 5 degrees of freedom the variance of chi square distribution is :

- (1) 5 (2) 6  
(3) 4 (4) 10

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A

80. In an unbalanced or skewed distribution, which measures of central tendency are least biased :

- (1) Mean (2) Mode  
(3) Median (4) Range

81. Which of the following compounds used for disinfection of water is *not* soluble but is prepared *in-situ* ?

- (1)  $\text{Cl}_2$  (2)  $\text{NaOCl}$   
(3)  $\text{HOCl}$  (4)  $\text{Cl}_2\text{O}$

82. Which is MIC based pesticide :

- (1) Aldicarb (2) Carbofuran  
(3) Sevin (4) All of the above

83. pH of rain water in an unpolluted atmosphere will be close to :

- (1) 7 (2) 6.5  
(3) 5 (4) 5.6

84. OH radical in atmosphere play a role of :

- (1) Green house gas (2) Reducing agent  
(3) Scavenger (4) Acidifier

85. Diesel oil is a fraction obtained between :

- (1) 40-120 C (2) 180-250 C  
(3) 250-320 C (4) 280-360 C

86. The dominant biogas is :

- (1) Methane (2) Ethane  
(3) CO<sub>2</sub> (4) H<sub>2</sub>

87. Depth of the oxidation ponds is typically :

- (1) 1-2 m (2) 2-5 m  
(3) 5-19 m (4) 10-20 m

88. The ore of uranium is :

- (1) Azurite (2) Chalcantite  
(3) Pitchblende (4) Saltpeter

89. The product formed is an isobar if there is :

- (1) 1 alpha emission  
(2) 1 alpha and 1 beta emission  
(3) 1 beta emission  
(4) 2 alpha and 1 beta emission

90. Syngas is a combination of :

- (1) CO + H<sub>2</sub> (2) CO<sub>2</sub> + H<sub>2</sub>  
(3) SO<sub>2</sub> + CO (4) CO + CH<sub>4</sub>

91. Airborne fraction is :

- (1) 44% (2) 42%  
(3) 38% (4) 52%

A

92. A species selected to represent an environmental cause and symbol for a defined habitat is called :
- (1) Flagship species (2) Keystone species  
(3) Umbrella species (4) Indicator species
93. Worm castings are rich in :
- (1) Nitrogen (2) Phosphorus  
(3) Calcium and others (4) All of the above
94. Red data book is published by :
- (1) WWF (2) IUCN  
(3) BNHS (4) Green peace
95. Most common volcanic rock :
- (1) Basalt (2) Rhyolite  
(3) Gabbro (4) Andesite
96. IAIA stands for :
- (1) International Association of Impact Assessment  
(2) Indian Association of Impact Assessment  
(3) International Assembly of Impact Assessment  
(4) Indian Assembly of Impact Assessment

97. ISWM stands for :

- (1) International Standards of Waste Management
- (2) Indian Standards for Waste Material
- (3) Integrated Solid Waste Management
- (4) International Solid Waste Management

98. Man and biosphere program is affiliated with :

- (1) UNESCO
- (2) IUCN
- (3) WWF
- (4) CIMOD

99. Indoor pollutant category :

- (1) O-16
- (2) N-13
- (3) C-14
- (4) Radon

100. The geometric mean of the numbers 2, 4, 8, 16, 32 is :

- (1) 12
- (2) 16
- (3) 8
- (4) 32

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(3) a-iv, b-iii, c-i, d-ii (4) a-iii, b-iv, c-i, d-ii

6. Most common form of Lead present in Pesticides :

- (1) PbTe (2) Pb(N<sub>3</sub>)<sub>2</sub>  
(3) Pb(C<sub>2</sub>H<sub>3</sub>O<sub>2</sub>)<sub>2</sub> (4) PbHAsO<sub>4</sub>

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(2) Anthracite < Bituminous < Lignite < Peat  
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(3) Committee for Advancement and Promotion of Rural Technology  
(4) Council for Advancement of People's Action and Rural Technology

**PHD/URS-EE-2022/(Environmental Sciences)(SET-Y)/(B)**



11. Airborne fraction is :

- (1) 44% (2) 42%  
(3) 38% (4) 52%

12. A species selected to represent an environmental cause and symbol for a defined habitat is called :

- (1) Flagship species  
(2) Keystone species  
(3) Umbrella species  
(4) Indicator species

13. Worm castings are rich in :

- (1) Nitrogen (2) Phosphorus  
(3) Calcium and others (4) All of the above

14. Red data book is published by :

- (1) WWF (2) IUCN  
(3) BNHS (4) Green peace

15. Most common volcanic rock :

- (1) Basalt (2) Rhyolite  
(3) Gabbro (4) Andesite

16. IAIA stands for :

- (1) International Association of Impact Assessment
- (2) Indian Association of Impact Assessment
- (3) International Assembly of Impact Assessment
- (4) Indian Assembly of Impact Assessment

17. ISWM stands for :

- (1) International Standards of Waste Management
- (2) Indian Standards for Waste Material
- (3) Integrated Solid Waste Management
- (4) International Solid Waste Management

18. Man and biosphere program is affiliated with :

- (1) UNESCO
- (2) IUCN
- (3) WWF
- (4) CIMOD

19. Indoor pollutant category :

- (1) O-16
- (2) N-13
- (3) C-14
- (4) Radon

20. The geometric mean of the numbers 2, 4, 8, 16, 32 is :

- (1) 12
- (2) 16
- (3) 8
- (4) 32

**PHD/URS-EE-2022/(Environmental Sciences)(SET-Y)/(B)**

21. What is the maximum period valid for granting Environmental Clearance (EC) for mining projects ?
- (1) 30 years (2) 10 years  
(3) 5 years (4) 20 years
22. Chemical composition of CFC-113 of ;
- (1)  $\text{CF}_2\text{ClCFCl}_2$  (2)  $\text{CFCICFCl}_2$   
(3)  $\text{CH}_4\text{Cl}$  (4)  $\text{CF}_2\text{Cl}$
23. 1dB unit, represents the ozone layer of thickness :
- (1) 1/100 of a cm (2) 1/10 of a cm  
(3) 1/100 of a mm (4) 1/10 of a mm
24. Types of tidal power plant :
- (1) Single basin double-effect Plant  
(2) Double basin with linked-basin operation  
(3) Double basin with paired-basin operation  
(4) All of the above
25. What is the example of Nominal variable ?
- (1) Gender (2) Population  
(3) Metabolism (4) None of these

26. Who was the woman activist who initiated the Chipko Movement in Reni Village of Chamoli District in 1973 ?
- (1) Smt. Gaura Devi (2) Smt. Amrita Devi  
(3) Smt. Sunita Devi (4) Smt. Ila Bhatt
27. "La Nina" is Spanish word meaning :
- (1) The little girl  
(2) The little boy  
(3) The son of the ocean  
(4) The daughter of the ocean
28. Pollutants in the soil can be broken down by microorganisms. The process is called :
- (1) Probiotics (2) Bioremediation  
(3) Bio-augmentation (4) None of these
29. For 5 degrees of freedom the variance of chi square distribution is :
- (1) 5 (2) 6  
(3) 4 (4) 10
30. In an unbalanced or skewed distribution, which measures of central tendency are least biased :
- (1) Mean (2) Mode  
(3) Median (4) Range

**PHD/URS-EE-2022/(Environmental Sciences)(SET-Y)/(B)**

31. Which instrument used to measure total solar irradiance on a plain surface ?
- (1) Lux meter (2) Pyranometer  
(3) Pyraheliometer (4) Campbell-Stoke Recorder
32. For a given noise signal, what would be the correct order of noise indices in terms of increasing value.
- i.  $L_{10}$   
ii.  $L_{50}$   
iii.  $L_1$   
iv.  $L_{90}$
- Choose the *correct* answer from the options :
- (1)  $iv < ii < i < iii$  (2)  $iii < i < ii < iv$   
(3)  $i < ii < iii < iv$  (4)  $iv < iii < ii < i$
33. Which mercury form is most toxic in water ?
- (1)  $Hg^+$  (2)  $Hg^0$   
(3)  $Hg^-$  (4)  $H_3C - Hg^+$
34. What is the frequency of red colour and wavelength of violet colour of solar radiation ?
- (1) 526-606 THz, 579-590 nm  
(2) 400-484 THz, 380-450 nm  
(3) 668-789 THz, 450-490 nm  
(4) 526-606 THz, 450-490 nm

35. In the 'A' weighting network used in noise measurement, sounds of which of the following frequencies would require the least correction ?
- (1) 1000 Hz (2) 120 Hz  
(3) 150 Hz (4) 31.5 Hz
36. Soil humic acids are :
- (1) Soluble in acid (2) Insoluble in acid  
(3) Soluble in alkali (4) Soluble in both acid and alkali
37. Which chemical form of mercury is completely water soluble ?
- (1) Elemental mercury in liquid state  
(2) Monomethyl mercury  
(3) Elemental mercury in vapour state  
(4) Dimethyl mercury
38. Which of the following is *not* a molecular method for identification of microbial population from soil or water ?
- (1) MPN (2) rRNA sequencing  
(3) RT-PCR (4) PCR
39. What is the concentration of  $H^+$  in a solution of 0.1 N NaOH at 25°C ?
- (1)  $10^{13}$  M (2)  $10^{-13}$  M  
(3)  $10^{-14}$  M (4)  $10^{14}$  M

B

40. For wind power generation, the percentage of maximum extractable power contained in the wind is :
- (1) ~45% (2) ~62%  
(3) ~59% (4) ~37%
41. Chemical Formula of CFC-12 is :
- (1)  $\text{CFCl}_3$  (2)  $\text{CF}_2\text{Cl}_2$   
(3)  $\text{CHFCl}_2$  (4)  $\text{CHCl}_3$
42. Satellite used for measuring precipitation TRMM called as :
- (1) Trans Rainfall measuring mission  
(2) Tundra Rainfall measuring mission  
(3) Tropical Rainfall measuring mission  
(4) Trans Regional measuring mission
43. In a horizontal wind turbine operated at maximum efficiency, Power is proportional to its diameter as :
- (1)  $D^2$  (2)  $D^3$   
(3)  $D^{1/2}$  (4)  $D$
44. Coriolis effect is greatest at :
- (1) West (2) East  
(3) Equator (4) Poles

45. Frankia is mainly involved in :

- |                     |                       |
|---------------------|-----------------------|
| (1) Ammonification  | (2) Nitrogen fixation |
| (3) Denitrification | (4) Nitrification     |

46. Mica minerals example are :

- |                      |                       |
|----------------------|-----------------------|
| (1) Biotite          | (2) Muscovite         |
| (3) Both (1) and (2) | (4) None of the above |

47. For acidified lakes mainly, which action is best recommended ?

- |                  |                 |
|------------------|-----------------|
| (1) Liming       | (2) Ozonation   |
| (3) Chlorination | (4) Ammoniation |

48. Best method for Ozone measurement is :

- (1) Gas Chromatography
- (2) Chemiluminescence
- (3) West and Gaeke method
- (4) Beta attenuation

49. Cost benefit analysis is performed during which stage ?

- (1) Feasibility study phase
- (2) Design phase
- (3) Maintenance phase
- (4) Implementation phase

**PHD/URS-EE-2022/(Environmental Sciences)(SET-Y)/(B)**



B

50. CSR called as "Corporate Social Responsibility" has been made mandatory since year :
- (1) 2014                (2) 2015                (3) 2017                (4) 2019
51. Compare sample variance to a theoretical population variance is called :
- (1) Z test                                        (2) F test  
(3) Chi Square test                                        (4) t Test
52. .... Force and ..... Force balance create the Geostrophic Winds.
- (1) Coriolis, Pressure gradient                                        (2) Centripetal, Centrifugal  
(3) Frictional, Pressure gradient                                        (4) Coriolis, Frictional
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- (1) Planck's law  
(2) Winkler's law  
(3) Second law of thermodynamics  
(4) First law of thermodynamics
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- (1) Sublimate the sample  
(2) Convert liquid sample into small droplets  
(3) Convert liquid sample into solid part  
(4) Convert liquid sample into gaseous form

55. Highest Bioconcentration Factor (BCF) is :

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|------------|----------------|
| (1) DDT    | (2) Heptachlor |
| (3) Eldrin | (4) DDE        |

56. World Ozone Day celebrated on :

- |                  |            |
|------------------|------------|
| (1) 16 September | (2) 5 June |
| (3) 16 October   | (4) 5 July |

57. UN Decade of Ocean Science for Sustainable Development is :

- |               |               |
|---------------|---------------|
| (1) 2011-2020 | (2) 2001-2010 |
| (3) 2021-2030 | (4) 1991-2000 |

58. The overall species diversity across communities within a larger geographic area is called :

- |                       |                     |
|-----------------------|---------------------|
| (1) Species diversity | (2) Gamma diversity |
| (3) Alpha diversity   | (4) Beta diversity  |

59. For detection of presence of  $\text{SO}_2$  and HF in air, which is used as plant Indicator ?

- |               |                      |
|---------------|----------------------|
| (1) Lichen    | (2) Blue green algae |
| (3) Red algae | (4) Orchid           |

60. Which is used in the Nalgonda technique of fluoride removal ?

- |                     |                     |
|---------------------|---------------------|
| (1) Potassium Salts | (2) Sulphur Salts   |
| (3) Zinc Salts      | (4) Aluminium Salts |

**PHD/URS-EE-2022/(Environmental Sciences)(SET-Y)/(B)**

B

61. Which Indian Ministry is concerned with EIA ?
- (1) Ministry of Social Justice and Empowerment
  - (2) Ministry of Road Transport and Highways
  - (3) Ministry of Environment, Forest and Climate Change
  - (4) Ministry of Home Affairs
62. In a bare land, the primary succession species is :
- (1) Crustose Lichen
  - (2) Foliage Lichen
  - (3) Mosses
  - (4) Bryophyta
63. Conference of Parties 27th Organised by which country ?
- (1) United Kingdom
  - (2) USA
  - (3) India
  - (4) Egypt
64. Wind rose represents :
- (1) Statistical distribution of wind speed in scalar form
  - (2) Statistical distribution of wind velocity in vector form
  - (3) Statistical distribution of wind speeds in histograms
  - (4) None of the above
65. Arsenic caused mainly :
- (1) Mesothelioma
  - (2) Black foot disease
  - (3) Cancer
  - (4) Blue baby syndrome

66. Red tide is caused by mainly :

- |                      |              |
|----------------------|--------------|
| (1) Blue green Algae | (2) Desmides |
| (3) Dianoflagillates | (4) Diatoms  |

67. The Asia-Pacific Ministerial Conference on Disaster Risk Reduction (APMCDRR) was organised by which country ?

- |               |            |
|---------------|------------|
| (1) Brazil    | (2) Russia |
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68. Vitrification is a process used mainly for :

- (1) Immobilize nuclear waste
- (2) Dispose nuclear waste
- (3) Spread nuclear waste
- (4) Move nuclear waste

69. Hydrocarbon which is mainly emitted by plant species mainly ?

- |              |                      |
|--------------|----------------------|
| (1) Pinene   | (2) Limonene         |
| (3) Isoprene | (4) All of the above |

70. SAFAR system for Air quality monitoring developed by :

- |                    |               |
|--------------------|---------------|
| (1) IIT Roorke     | (2) IITM Pune |
| (3) IISc Bangalore | (4) IIT Delhi |

**PHD/URS-EE-2022/(Environmental Sciences)(SET-Y)/(B)**

B

71. The ash content in coal used in stand-alone thermal power plants in India should not be more than :

- (1) 20% (2) 27%  
 (3) 34% (4) 40%

72. Which of the following are living fossils ?

- i. Ginkgo biloba  
 ii. Panthera tigris  
 iii. Elephas Maximus  
 iv. Latimavia

- (1) i and iv only (2) i and iii only  
 (3) ii and iii only (4) ii and iv only

73. Which of the following mixture of gases can be found in biogas ?

- (1) CO, CH<sub>4</sub>, NO, N<sub>2</sub>S, H<sub>2</sub>O vapour  
 (2) CO<sub>2</sub>, CH<sub>4</sub>, NH<sub>3</sub>, H<sub>2</sub>O vapour, H<sub>2</sub>S  
 (3) CO<sub>2</sub>, CH<sub>4</sub>, NO, NH<sub>3</sub>  
 (4) CO, CO<sub>2</sub>, H<sub>2</sub>O, NO, CH<sub>4</sub>

74. At STP, 1 ppb sulphur dioxide is equivalent to :

- (1)  $\sim 7.31 \mu \text{ gm}^{-3}$  (2)  $\sim 3.16 \mu \text{ gm}^{-3}$   
 (3)  $\sim 4.52 \mu \text{ gm}^{-3}$  (4)  $\sim 2.86 \mu \text{ gm}^{-3}$

PHD/URS-EE-2022/(Environmental Sciences)(SET-Y)/(B)

P. T. O.

75. Who launched the "Green Belt Movement" in Kenya ?
- (1) Koichi Tanaka (2) Gehard Ertl  
(3) Wangari Maathai (4) Ryojii Noyori
76. The major product of slow pyrolysis of biomass is :
- (1) Biogas (2) Bio char  
(3) CO<sub>2</sub> (4) CO
77. Ecotone between Fresh water and terrestrial ecosystems is known as :
- (1) Riparian Zone (2) Hyporheic Zone  
(3) Benthic Zone (4) Epilimnetic Zone
78. Hyperthermophilic microorganisms prefer temperatures in excess of :
- (1) 45°C (2) 80°C  
(3) 65°C (4) 70°C
79. Which species is *not* Epigeic Earthworm species ?
- (1) Metaphire posthuma (2) Endrilus eugeniae  
(3) Eisenia Andrei (4) Eisenia fetida
80. World Habitat Day is celebrated on :
- (1) 5 October (2) 22 March  
(3) 16 September (4) 21 March

**PHD/URS-EE-2022/(Environmental Sciences)(SET-Y)/(B)**

81. Public hearing is mandatory for project like :
- (1) Mining project (2) River valley project  
(3) Oil refinery project (4) All of the above
82. "Cool global climate" effect in the Earth's atmosphere is due to :
- (1) Sulphate Aerosol (2) Nitrate Aerosol  
(3) Oxide Aerosol (4) None of the above
83. Mudflow of a slurry of Pyroclastic material of rocks and water from a volcano along with river valley ?
- (1) Mudflow (2) Avalanches  
(3) Lahars (4) Solifluction
84. Trans-boundary movement of hazardous waste and disposal was adopted in year 1989 is called ?
- (1) Basel convention  
(2) Montreal protocol  
(3) Convention on Biological diversity  
(4) All of the above
85. Recently Government announced "Indian Biological Data Centre" in which district of Haryana ?
- (1) Gurugram (2) Faridabad  
(3) Rewari (4) Panchkula

86. Leopold developed Interaction matrix which contains how many parameters ?
- (1) 90 (2) 100  
(3) 30 (4) 120
87. Which Microwave band in remote sensing is suitable for "Height measurement of trees" ?
- (1) C (2) X  
(3) S (4) L
88. Which statement is *correct* about Los Angeles smog is ?
- (1) Oxidizing nature  
(2) Due to PAN and Ozone  
(3) Both (1) and (2)  
(4) None of the above
89. Predator-prey relation in biological system is mainly explained by ?
- (1) Lotka-Volterra equation  
(2) Box model  
(3) Lefkovitch matrix  
(4) Leslies matrix model
90. The Harmonic mean of the numbers 10, 15 and 30 :
- (1) 20 (2) 15  
(3) 40 (4) 10

PHD/URS-EE-2022/(Environmental Sciences)(SET-Y)/(B)



91. Which of the following compounds used for disinfection of water is *not* soluble but is prepared *in-situ* ?
- (1)  $\text{Cl}_2$  (2)  $\text{NaOCl}$   
(3)  $\text{HOCl}$  (4)  $\text{Cl}_2\text{O}$
92. Which is MIC based pesticide :
- (1) Aldicarb (2) Carbofuran  
(3) Sevin (4) All of the above
93. pH of rain water in an unpolluted atmosphere will be close to :
- (1) 7 (2) 6.5  
(3) 5 (4) 5.6
94. OH radical in atmosphere play a role of :
- (1) Green house gas (2) Reducing agent  
(3) Scavenger (4) Acidifier
95. Diesel oil is a fraction obtained between :
- (1) 40-120 C (2) 180-250 C  
(3) 250-320 C (4) 280-360 C
96. The dominant biogas is :
- (1) Methane (2) Ethane  
(3)  $\text{CO}_2$  (4)  $\text{H}_2$

97. Depth of the oxidation ponds is typically :

- |            |             |
|------------|-------------|
| (1) 1-2 m  | (2) 2-5 m   |
| (3) 5-19 m | (4) 10-20 m |

98. The ore of uranium is :

- |                 |                 |
|-----------------|-----------------|
| (1) Azurite     | (2) Chalcantite |
| (3) Pitchblende | (4) Saltpeter   |

99. The product formed is an isobar if there is :

- (1) 1 alpha emission
- (2) 1 alpha and 1 beta emission
- (3) 1 beta emission
- (4) 2 alpha and 1 beta emission

100. Syngas is a combination of :

- |                               |                                |
|-------------------------------|--------------------------------|
| (1) $\text{CO} + \text{H}_2$  | (2) $\text{CO}_2 + \text{H}_2$ |
| (3) $\text{SO}_2 + \text{CO}$ | (4) $\text{CO} + \text{CH}_4$  |

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU  
ARE ASKED TO DO SO)

**C**

**SET-Y**

**PHD/URS-EE-DEC-2022**

**SUBJECT : Environmental Sciences**

**10099**

Sr. No. ....

Time : 1¼ Hours

Max. Marks : 100

Total Questions : 100

Roll No. (in figures) \_\_\_\_\_ (in words) \_\_\_\_\_

Name \_\_\_\_\_ Date of Birth \_\_\_\_\_

Father's Name \_\_\_\_\_ Mother's Name \_\_\_\_\_

Date of Examination \_\_\_\_\_

\_\_\_\_\_  
(Signature of the Candidate)

\_\_\_\_\_  
(Signature of the Invigilator)

**CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE  
STARTING THE QUESTION PAPER.**

1. **All questions are compulsory.**
2. The candidates **must return** the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair means / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
3. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
4. Question Booklet along with answer key of all the A, B, C & D code shall be got uploaded on the University website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the Question Booklet/Answer Key within 24 hours of uploading the same on the University Website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case, will be considered.
5. The candidate **must not** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question booklet itself. Answers **must not** be ticked in the question booklet.
6. **There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.**
7. Use only **Black** or **Blue Ball Point Pen** of good quality in the OMR Answer-Sheet.
8. **Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after starting of the examination.**

**PHD/URS-EE-2022/(Environmental Sciences)(SET-Y)/(C)**

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- |                     |                     |
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**PHD/URS-EE-2022/(Environmental Sciences)(SET-Y)/(C)**

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- (1) Nitrogen                      (2) Phosphorus  
(3) Calcium and others                      (4) All of the above

34. Red data book is published by :

- (1) WWF                      (2) IUCN  
(3) BNHS                      (4) Green peace

35. Most common volcanic rock :

- (1) Basalt                      (2) Rhyolite                      (3) Gabbro                      (4) Andesite

36. IAIA stands for :

- (1) International Association of Impact Assessment  
(2) Indian Association of Impact Assessment  
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37. ISWM stands for :

- (1) International Standards of Waste Management
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38. Man and biosphere program is affiliated with :

- (1) UNESCO
- (2) IUCN
- (3) WWF
- (4) CIMOD

39. Indoor pollutant category :

- (1) O-16
- (2) N-13
- (3) C-14
- (4) Radon

40. The geometric mean of the numbers 2, 4, 8, 16, 32 is :

- (1) 12
- (2) 16
- (3) 8
- (4) 32

41. The ash content in coal used in stand-alone thermal power plants in India should not be more than :

- (1) 20%
- (2) 27%
- (3) 34%
- (4) 40%

**PHD/URS-EE-2022/(Environmental Sciences)(SET-Y)/(C)**

42. Which of the following are living fossils ?
- Ginkgo biloba
  - Panthera tigris
  - Elephas Maximus
  - Latimavia
- (1) i and iv only (2) i and iii only  
(3) ii and iii only (4) ii and iv only
43. Which of the following mixture of gases can be found in biogas ?
- (1) CO, CH<sub>4</sub>, NO, N<sub>2</sub>S, H<sub>2</sub>O vapour  
(2) CO<sub>2</sub>, CH<sub>4</sub>, NH<sub>3</sub>, H<sub>2</sub>O vapour, H<sub>2</sub>S  
(3) CO<sub>2</sub>, CH<sub>4</sub>, NO, NH<sub>3</sub>  
(4) CO, CO<sub>2</sub>, H<sub>2</sub>O, NO, CH<sub>4</sub>
44. At STP, 1 ppb sulphur dioxide is equivalent to :
- (1)  $\sim 7.31 \mu \text{ gm}^{-3}$  (2)  $\sim 3.16 \mu \text{ gm}^{-3}$   
(3)  $\sim 4.52 \mu \text{ gm}^{-3}$  (4)  $\sim 2.86 \mu \text{ gm}^{-3}$
45. Who launched the "Green Belt Movement" in Kenya ?
- (1) Koichi Tanaka (2) Gehard Ertl  
(3) Wangari Maathai (4) Ryojii Noyori

46. The major product of slow pyrolysis of biomass is :

- (1) Biogas (2) Bio char  
(3) CO<sub>2</sub> (4) CO

47. Ecotone between Fresh water and terrestrial ecosystems is known as :

- (1) Riparian Zone (2) Hyporheic Zone  
(3) Benthic Zone (4) Epilimnetic Zone

48. Hyperthermophilic microorganisms prefer temperatures in excess of :

- (1) 45°C (2) 80°C  
(3) 65°C (4) 70°C

49. Which species is *not* Epigeic Earthworm species ?

- (1) *Metaphire posthuma* (2) *Endrilus eugeniae*  
(3) *Eisenia Andrei* (4) *Eisenia fetida*

50. World Habitat Day is celebrated on :

- (1) 5 October (2) 22 March  
(3) 16 September (4) 21 March

51. Chemical Formula of CFC-12 is :

- (1) CFCl<sub>3</sub> (2) CF<sub>2</sub>Cl<sub>2</sub>  
(3) CHFCl<sub>2</sub> (4) CHCl<sub>3</sub>

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52. Satellite used for measuring precipitation TRMM called as :

- (1) Trans Rainfall measuring mission
- (2) Tundra Rainfall measuring mission
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53. In a horizontal wind turbine operated at maximum efficiency, Power is proportional to its diameter as :

- (1)  $D^2$
- (2)  $D^3$
- (3)  $D^{1/2}$
- (4)  $D$

54. Coriolis effect is greatest at :

- (1) West
- (2) East
- (3) Equator
- (4) Poles

55. Frankia is mainly involved in :

- (1) Ammonification
- (2) Nitrogen fixation
- (3) Denitrification
- (4) Nitrification

56. Mica minerals example are :

- (1) Biotite
- (2) Muscovite
- (3) Both (1) and (2)
- (4) None of the above

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- (1) Liming (2) Ozonation  
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- (1) Gas Chromatography  
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(3) West and Gaeke method  
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- (1)  $\text{CF}_2\text{ClCFCl}_2$  (2)  $\text{CFCICFCI}_2$   
(3)  $\text{CH}_4\text{Cl}$  (4)  $\text{CF}_2\text{Cl}$

63. 1dB unit, represents the ozone layer of thickness :

- (1) 1/100 of a cm (2) 1/10 of a cm  
(3) 1/100 of a mm (4) 1/10 of a mm

64. Types of tidal power plant :

- (1) Single basin double-effect Plant  
(2) Double basin with linked-basin operation  
(3) Double basin with paired-basin operation  
(4) All of the above

65. What is the example of Nominal variable ?

- (1) Gender (2) Population  
(3) Metabolism (4) None of these

66. Who was the woman activist who initiated the Chipko Movement in Reni Village of Chamoli District in 1973 ?

- (1) Smt. Gaura Devi (2) Smt. Amrita Devi  
(3) Smt. Sunita Devi (4) Smt. Ila Bhatt



67. "La Nina" is Spanish word meaning :

- (1) The little girl
- (2) The little boy
- (3) The son of the ocean
- (4) The daughter of the ocean

68. Pollutants in the soil can be broken down by microorganisms. The process is called :

- (1) Probiotics
- (2) Bioremediation
- (3) Bio-augmentation
- (4) None of these

69. For 5 degrees of freedom the variance of chi square distribution is :

- (1) 5
- (2) 6
- (3) 4
- (4) 10

70. In an unbalanced or skewed distribution, which measures of central tendency are least biased :

- (1) Mean
- (2) Mode
- (3) Median
- (4) Range

71. Which of the following compounds used for disinfection of water is **not** soluble but is prepared *in-situ* ?

- (1)  $\text{Cl}_2$
- (2)  $\text{NaOCl}$
- (3)  $\text{HOCl}$
- (4)  $\text{Cl}_2\text{O}$

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C

72. Which is MIC based pesticide :

- (1) Aldicarb (2) Carbofuran  
(3) Sevin (4) All of the above

73. pH of rain water in an unpolluted atmosphere will be close to :

- (1) 7 (2) 6.5  
(3) 5 (4) 5.6

74. OH radical in atmosphere play a role of :

- (1) Green house gas (2) Reducing agent  
(3) Scavenger (4) Acidifier

75. Diesel oil is a fraction obtained between :

- (1) 40-120 C (2) 180-250 C  
(3) 250-320 C (4) 280-360 C

76. The dominant biogas is :

- (1) Methane (2) Ethane  
(3) CO<sub>2</sub> (4) H<sub>2</sub>

77. Depth of the oxidation ponds is typically :

- (1) 1-2 m (2) 2-5 m  
(3) 5-19 m (4) 10-20 m

78. The ore of uranium is :  
(1) Azurite  
(2) Chalcantite  
(3) Pitchblende  
(4) Saltpeter
79. The product formed is an isobar if there is :  
(1) 1 alpha emission  
(2) 1 alpha and 1 beta emission  
(3) 1 beta emission  
(4) 2 alpha and 1 beta emission
80. Syngas is a combination of :  
(1)  $\text{CO} + \text{H}_2$   
(2)  $\text{CO}_2 + \text{H}_2$   
(3)  $\text{SO}_2 + \text{CO}$   
(4)  $\text{CO} + \text{CH}_4$
81. How many wetland sites of India are in Montreux record ?  
(1) 1  
(2) 3  
(3) 10  
(4) 2
82. Which of the following is an Organochlorine insecticide ?  
(1) Aldrin  
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(3)  $\text{CO}_2$   
(4)  $\text{H}_2\text{S}$
84. As "Eco-mark" is the Ecolabel of India. Which of the following is Eco label of USA ?  
(1) Green Seal  
(2) Blue Angle  
(3) Eco Garantie  
(4) None of the above

85. Match the following :

**List-I**

- a. Quartz
- b. Topaz
- c. Kalsilite
- d. Dolomite

(1) a-i, b-ii, c-iii, d-iv

(3) a-iv, b-iii, c-i, d-ii

**List-II**

- i.  $\text{CaMg}(\text{CO}_3)_2$
- ii.  $\text{SiO}_2$
- iii.  $\text{Al}_2\text{SiO}_4(\text{OH})_2$
- iv.  $\text{KAlSiO}_4$

(2) a-ii, b-iii, c-iv, d-i

(4) a-iii, b-iv, c-i, d-ii

86. Most common form of Lead present in Pesticides :

(1)  $\text{PbTe}$

(2)  $\text{Pb}(\text{N}_3)_2$

(3)  $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2$

(4)  $\text{PbHAsO}_4$

87. According to heat value of coal, which is the best representation ?

(1) Peat < Lignite < Bituminous < Anthracite

(2) Anthracite < Bituminous < Lignite < Peat

(3) Peat < Anthracite < Bituminous < Lignite

(4) Anthracite < Peat < Lignite < Bituminous

88. Which is *not* the best tool to study Landscape fragmentation ?

(1) GIS

(2) Geodesy

(3) Cartography

(4) Remote Sensing

89. With the increase of rate of population growth, Doubling time :

- (1) Decrease (2) Increase  
(3) Both (1) & (2) (4) None of the above

90. CAPART stands for ?

- (1) Committee for Advancement and Privatization of Rural Technology  
(2) Council for Advancement of Rural Technology  
(3) Committee for Advancement and Promotion of Rural Technology  
(4) Council for Advancement of People's Action and Rural Technology

91. Which instrument used to measure total solar irradiance on a plain surface ?

- (1) Lux meter (2) Pyranometer  
(3) Pyraheliometer (4) Campbell-Stoke Recorder

92. For a given noise signal, what would be the correct order of noise indices in terms of increasing value.

- i.  $L_{10}$   
ii.  $L_{50}$   
iii.  $L_1$   
iv.  $L_{90}$

Choose the *correct* answer from the options :

- (1)  $iv < ii < i < iii$  (2)  $iii < i < ii < iv$   
(3)  $i < ii < iii < iv$  (4)  $iv < iii < ii < i$

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- C
93. Which mercury form is most toxic in water ?
- (1)  $\text{Hg}^+$  (2)  $\text{Hg}^0$   
(3)  $\text{Hg}^-$  (4)  $\text{H}_3\text{C} - \text{Hg}^+$
94. What is the frequency of red colour and wavelength of violet colour of solar radiation ?
- (1) 526-606 THz, 579-590 nm  
(2) 400-484 THz, 380-450 nm  
(3) 668-789 THz, 450-490 nm  
(4) 526-606 THz, 450-490 nm
95. In the 'A' weighting network used in noise measurement, sounds of which of the following frequencies would require the least correction ?
- (1) 1000 Hz (2) 120 Hz  
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96. Soil humic acids are :
- (1) Soluble in acid  
(2) Insoluble in acid  
(3) Soluble in alkali  
(4) Soluble in both acid and alkali

97. Which chemical form of mercury is completely water soluble ?
- (1) Elemental mercury in liquid state
  - (2) Monomethyl mercury
  - (3) Elemental mercury in vapour state
  - (4) Dimethyl mercury
98. Which of the following is *not* a molecular method for identification of microbial population from soil or water ?
- (1) MPN
  - (2) rRNA sequencing
  - (3) RT-PCR
  - (4) PCR
99. What is the concentration of  $H^+$  in a solution of 0.1 N NaOH at  $25^\circ C$  ?
- (1)  $10^{13}$  M
  - (2)  $10^{-13}$  M
  - (3)  $10^{-14}$  M
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100. For wind power generation, the percentage of maximum extractable power contained in the wind is :
- (1) ~45%
  - (2) ~62%
  - (3) ~59%
  - (4) ~37%

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU  
ARE ASKED TO DO SO)

**D**

**SET-Y**

**PHD/URS-EE-DEC-2022**

**SUBJECT : Environmental Sciences**

**10100**

Sr. No. ....

Time : 1¼ Hours

Max. Marks : 100

Total Questions : 100

Roll No. (in figures) \_\_\_\_\_ (in words) \_\_\_\_\_

Name \_\_\_\_\_ Date of Birth \_\_\_\_\_

Father's Name \_\_\_\_\_ Mother's Name \_\_\_\_\_

Date of Examination \_\_\_\_\_

\_\_\_\_\_  
(Signature of the Candidate)

\_\_\_\_\_  
(Signature of the Invigilator)

**CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE  
STARTING THE QUESTION PAPER.**

- All questions are compulsory.**
- The candidates **must return** the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
- Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
- Question Booklet along with answer key of all the A, B, C & D code shall be got uploaded on the University website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the Question Booklet/Answer Key within 24 hours of uploading the same on the University Website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case, will be considered.
- The candidate **must not** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question booklet itself. Answers **must not** be ticked in the question booklet.
- There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.**
- Use only **Black** or **Blue Ball Point Pen** of good quality in the OMR Answer-Sheet.
- Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after starting of the examination.**

**PHD/URS-EE-2022/(Environmental Sciences)(SET-Y)/(D)**



D

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|--------------|---|
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36. Most common form of Lead present in Pesticides :

- (1) PbTe (2) Pb(N<sub>3</sub>)<sub>2</sub>  
(3) Pb(C<sub>2</sub>H<sub>3</sub>O<sub>2</sub>)<sub>2</sub> (4) PbHAsO<sub>4</sub>

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D

41. Airborne fraction is :

- (1) 44% (2) 42%  
(3) 38% (4) 52%

42. A species selected to represent an environmental cause and symbol for a defined habitat is called :

- (1) Flagship species (2) Keystone species  
(3) Umbrella species (4) Indicator species

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- (1) O-16
- (2) N-13
- (3) C-14
- (4) Radon

50. The geometric mean of the numbers 2, 4, 8, 16, 32 is :

- (1) 12
- (2) 16
- (3) 8
- (4) 32

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51. The ash content in coal used in stand-alone thermal power plants in India should not be more than :
- (1) 20% (2) 27%  
(3) 34% (4) 40%
52. Which of the following are living fossils ?
- i. Ginkgo biloba  
ii. Panthera tigris  
iii. Elephas Maximus  
iv. Latimavia
- (1) i and iv only (2) i and iii only  
(3) ii and iii only (4) ii and iv only
53. Which of the following mixture of gases can be found in biogas ?
- (1) CO, CH<sub>4</sub>, NO, N<sub>2</sub>S, H<sub>2</sub>O vapour  
(2) CO<sub>2</sub>, CH<sub>4</sub>, NH<sub>3</sub>, H<sub>2</sub>O vapour, H<sub>2</sub>S  
(3) CO<sub>2</sub>, CH<sub>4</sub>, NO, NH<sub>3</sub>  
(4) CO, CO<sub>2</sub>, H<sub>2</sub>O, NO, CH<sub>4</sub>
54. At STP, 1 ppb sulphur dioxide is equivalent to :
- (1)  $\sim 7.31 \mu \text{ gm}^{-3}$  (2)  $\sim 3.16 \mu \text{ gm}^{-3}$   
(3)  $\sim 4.52 \mu \text{ gm}^{-3}$  (4)  $\sim 2.86 \mu \text{ gm}^{-3}$

55. Who launched the "Green Belt Movement" in Kenya ?
- (1) Koichi Tanaka (2) Gehard Ertl  
(3) Wangari Maathai (4) Ryojii Noyori
56. The major product of slow pyrolysis of biomass is :
- (1) Biogas (2) Bio char  
(3) CO<sub>2</sub> (4) CO
57. Ecotone between Fresh water and terrestrial ecosystems is known as :
- (1) Riparian Zone (2) Hyporheic Zone  
(3) Benthic Zone (4) Epilimnetic Zone
58. Hyperthermophilic microorganisms prefer temperatures in excess of :
- (1) 45°C (2) 80°C  
(3) 65°C (4) 70°C
59. Which species is *not* Epigeic Earthworm species ?
- (1) *Metaphire posthuma* (2) *Endrilus eugeniae*  
(3) *Eisenia Andrei* (4) *Eisenia fetida*
60. World Habitat Day is celebrated on :
- (1) 5 October (2) 22 March  
(3) 16 September (4) 21 March

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61. Which of the following compounds used for disinfection of water is *not* soluble but is prepared *in-situ* ?
- (1)  $\text{Cl}_2$  (2)  $\text{NaOCl}$   
(3)  $\text{HOCl}$  (4)  $\text{Cl}_2\text{O}$
62. Which is MIC based pesticide :
- (1) Aldicarb (2) Carbofuran  
(3) Sevin (4) All of the above
63. pH of rain water in an unpolluted atmosphere will be close to :
- (1) 7 (2) 6.5  
(3) 5 (4) 5.6
64. OH radical in atmosphere play a role of :
- (1) Green house gas (2) Reducing agent  
(3) Scavenger (4) Acidifier
65. Diesel oil is a fraction obtained between :
- (1) 40-120 C (2) 180-250 C  
(3) 250-320 C (4) 280-360 C
66. The dominant biogas is :
- (1) Methane (2) Ethane  
(3)  $\text{CO}_2$  (4)  $\text{H}_2$

67. Depth of the oxidation ponds is typically :

- |            |             |
|------------|-------------|
| (1) 1-2 m  | (2) 2-5 m   |
| (3) 5-19 m | (4) 10-20 m |

68. The ore of uranium is :

- |                 |                 |
|-----------------|-----------------|
| (1) Azurite     | (2) Chalcantite |
| (3) Pitchblende | (4) Saltpeter   |

69. The product formed is an isobar if there is :

- (1) 1 alpha emission
- (2) 1 alpha and 1 beta emission
- (3) 1 beta emission
- (4) 2 alpha and 1 beta emission

70. Syngas is a combination of :

- |                               |                                |
|-------------------------------|--------------------------------|
| (1) $\text{CO} + \text{H}_2$  | (2) $\text{CO}_2 + \text{H}_2$ |
| (3) $\text{SO}_2 + \text{CO}$ | (4) $\text{CO} + \text{CH}_4$  |

71. Which Indian Ministry is concerned with EIA ?

- (1) Ministry of Social Justice and Empowerment
- (2) Ministry of Road Transport and Highways
- (3) Ministry of Environment, Forest and Climate Change
- (4) Ministry of Home Affairs

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72. In a bare land, the primary succession species is :
- (1) Crustose Lichen (2) Foliage Lichen  
(3) Mosses (4) Bryophyta
73. Conference of Parties 27th Organised by which country ?
- (1) United Kingdom (2) USA  
(3) India (4) Egypt
74. Wind rose represents :
- (1) Statistical distribution of wind speed in scalar form  
(2) Statistical distribution of wind velocity in vector form  
(3) Statistical distribution of wind speeds in histograms  
(4) None of the above
75. Arsenic caused mainly :
- (1) Mesothelioma  
(2) Black foot disease  
(3) Cancer  
(4) Blue baby syndrome
76. Red tide is caused by mainly :
- (1) Blue green Algae (2) Desmides  
(3) Dianoflagillates (4) Diatoms

77. The Asia-Pacific Ministerial Conference on Disaster Risk Reduction (APMCDRR) was organised by which country ?
- (1) Brazil (2) Russia  
(3) Australia (4) India
78. Vitrification is a process used mainly for :
- (1) Immobilize nuclear waste  
(2) Dispose nuclear waste  
(3) Spread nuclear waste  
(4) Move nuclear waste
79. Hydrocarbon which is mainly emitted by plant species mainly ?
- (1) Pinene (2) Limonene  
(3) Isoprene (4) All of the above
80. SAFAR system for Air quality monitoring developed by :
- (1) IIT Roorke (2) IITM Pune  
(3) IISc Bangalore (4) IIT Delhi
81. Compare sample variance to a theoretical population variance is called :
- (1) Z test (2) F test  
(3) Chi Square test (4) t Test



82. .... Force and ..... Force balance create the Geostrophic Winds.
- (1) Coriolis, Pressure gradient
  - (2) Centripetal, Centrifugal
  - (3) Frictional, Pressure gradient
  - (4) Coriolis, Frictional
83. Energy flow in an ecosystem is depicted by :
- (1) Planck's law
  - (2) Winkler's law
  - (3) Second law of thermodynamics
  - (4) First law of thermodynamics
84. In AAS, process of "Nebulisation" refers :
- (1) Sublimate the sample
  - (2) Convert liquid sample into small droplets
  - (3) Convert liquid sample into solid part
  - (4) Convert liquid sample into gaseous form
85. Highest Bioconcentration Factor (BCF) is :
- |            |                |
|------------|----------------|
| (1) DDT    | (2) Heptachlor |
| (3) Eldrin | (4) DDE        |

86. World Ozone Day celebrated on :

- |                  |            |
|------------------|------------|
| (1) 16 September | (2) 5 June |
| (3) 16 October   | (4) 5 July |

87. UN Decade of Ocean Science for Sustainable Development is :

- |               |               |
|---------------|---------------|
| (1) 2011-2020 | (2) 2001-2010 |
| (3) 2021-2030 | (4) 1991-2000 |

88. The overall species diversity across communities within a larger geographic area is called :

- |                       |                     |
|-----------------------|---------------------|
| (1) Species diversity | (2) Gamma diversity |
| (3) Alpha diversity   | (4) Beta diversity  |

89. For detection of presence of  $\text{SO}_2$  and HF in air, which is used as plant Indicator ?

- |               |                      |
|---------------|----------------------|
| (1) Lichen    | (2) Blue green algae |
| (3) Red algae | (4) Orchid           |

90. Which is used in the Nalgonda technique of fluoride removal ?

- |                     |                     |
|---------------------|---------------------|
| (1) Potassium Salts | (2) Sulphur Salts   |
| (3) Zinc Salts      | (4) Aluminium Salts |

91. Public hearing is mandatory for project like :

- |                          |                          |
|--------------------------|--------------------------|
| (1) Mining project       | (2) River valley project |
| (3) Oil refinery project | (4) All of the above     |

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92. "Cool global climate" effect in the Earth's atmosphere is due to :
- (1) Sulphate Aerosol (2) Nitrate Aerosol  
(3) Oxide Aerosol (4) None of the above
93. Mudflow of a slurry of Pyroclastic material of rocks and water from a volcano along with river valley ?
- (1) Mudflow (2) Avalanches  
(3) Lahars (4) Solifluction
94. Trans-boundary movement of hazardous waste and disposal was adopted in year 1989 is called ?
- (1) Basel convention  
(2) Montreal protocol  
(3) Convention on Biological diversity  
(4) All of the above
95. Recently Government announced "Indian Biological Data Centre" in which district of Haryana ?
- (1) Gurugram (2) Faridabad  
(3) Rewari (4) Panchkula
96. Leopold developed Interaction matrix which contains how many parameters ?
- (1) 90 (2) 100  
(3) 30 (4) 120

97. Which Microwave band in remote sensing is suitable for "Height measurement of trees" ?
- (1) C (2) X  
(3) S (4) L
98. Which statement is *correct* about Los Angeles smog is ?
- (1) Oxidizing nature  
(2) Due to PAN and Ozone  
(3) Both (1) and (2)  
(4) None of the above
99. Predator-prey relation in biological system is mainly explained by ?
- (1) Lotka-Volterra equation  
(2) Box model  
(3) Lefkovitch matrix  
(4) Leslies matrix model
100. The Harmonic mean of the numbers 10, 15 and 30 :
- (1) 20 (2) 15  
(3) 40 (4) 10

ANSWER KEYS OF ENVIRONMENT SC. FOR SESSION 2022-23				
Q. NO.	A	B	C	D
1	4	4	3	1
2	1	4	1	1
3	3	3	4	3
4	1	1	2	4
5	2	2	1	1
6	1	4	3	1
7	4	1	3	1
8	3	2	1	2
9	1	1	4	3
10	2	4	2	4
11	4	1	3	2
12	4	1	1	1
13	3	4	4	4
14	1	2	2	2
15	2	1	1	1
16	4	1	1	2
17	1	3	3	4
18	2	1	4	1
19	1	4	1	2
20	4	3	4	3
21	3	1	4	2
22	1	1	1	3
23	4	3	3	1
24	2	4	1	4
25	1	1	2	2
26	1	1	1	3
27	3	1	4	1
28	4	2	3	2
29	1	3	1	1
30	4	4	2	1
31	2	2	1	4
32	3	1	1	4
33	1	4	4	3
34	4	2	2	1
35	2	1	1	2
36	3	2	1	4
37	1	4	3	1
38	2	1	1	2
39	1	2	4	1
40	1	3	3	4
41	3	2	3	1
42	1	3	1	1
43	4	1	2	4
44	2	4	4	2
45	1	2	3	1
46	3	3	2	1
47	3	1	1	3
48	1	2	2	1
49	4	1	1	4
50	2	1	1	3

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ANSWER KEYS OF ENVIRONMENT SC. FOR SESSION 2022-23				
Q. NO.	A	B	C	D
51	2	3	2	3
52	1	1	3	1
53	4	4	1	2
54	2	2	4	4
55	1	1	2	3
56	2	1	3	2
57	4	3	1	1
58	1	4	2	2
59	2	1	1	1
60	3	4	1	1
61	3	3	1	1
62	1	1	1	1
63	2	4	3	2
64	4	2	4	3
65	3	1	1	2
66	2	3	1	1
67	1	3	1	1
68	2	1	2	3
69	1	4	3	3
70	1	2	4	1
71	1	3	1	3
72	1	1	1	1
73	3	2	2	4
74	4	4	3	2
75	1	3	2	1
76	1	2	1	3
77	1	1	1	3
78	2	2	3	1
79	3	1	3	4
80	4	1	1	2
81	1	4	4	3
82	1	1	4	1
83	2	3	3	4
84	3	1	1	2
85	2	2	2	1
86	1	1	4	1
87	1	4	1	3
88	3	3	2	4
89	3	1	1	1
90	1	2	4	4
91	1	1	2	4
92	1	1	1	1
93	4	2	4	3
94	2	3	2	1
95	1	2	1	2
96	1	1	2	1
97	3	1	4	4
98	1	3	1	3
99	4	3	2	1
100	3	1	3	2

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