Question Booklet Sr. No.

1009

Roll No. .....

OMR Sheet No. .....

Ph.D.–2012

ENVIRONMENTAL SCIENCE ENTRANCE TEST, MARCH 2020

Time : 2 Hours

Maximum Marks : **200**

Number of Pages in this Booklet : **20**

Number of Questions in this Booklet : **100**

INSTRUCTIONS FOR THE CANDIDATES

(i) Check this booklet carefully for the sequence of pages and questions. If it is defective due to pages/questions missing or not in serial order or any other discrepancy it should be got replaced immediately from the invigilator within the period of 5 minutes. Afterwards neither the Question Booklet will be replaced nor any extra time will be given.

(ii) After this verification write your Roll No. and OMR Sheet Number on this Question Booklet.

(iii) **Use only Black or Blue ball point pen.**

(iv) This paper consists of **100** multiple choice type questions. Each question has four alternative answers (a), (b), (c) and (d). **Only one of these alternative answer is correct**. You are required to darken completely the circle of correct answer in the OMR Sheet.

(v) There is **no negative marking.**

(vi) Do not write anything other than relevant entries or put any mark on any part of the OMR Sheet, which may disclose your identity, otherwise you will render yourself liable to disqualification.

(vii) Use of electronic gadgets such as pager, cell phone, calculator and log table etc. is prohibited.

(viii) Rough Work may be done in the end of this booklet.

(ix) You have to **return the OMR Sheet** to the invigilator at the end of the examination compulsorily.

SEAL

1. The earth's atmospheric window is represented by which of the following region of EMR:

(a) Ultraviolet region
(b) Visible region
(c) Infrared region
(d) Polar regions

2. The combined albedo of the earth and the atmosphere is approximately:

(a) 4%
(b) 10%
(c) 30%
(d) 50%

3. According to Wein's Displacement Law, the wavelength at which maximum radiation occurs is

(a) Inversely proportional to the temperature
(b) Directly proportional to the temperature
(c) Inversely proportional to the pressure
(d) Directly proportional to the pressure

4. Remote sensing techniques make use of

(a) Electric waves
(b) Micro-waves
(c) Ultraviolet-waves
(d) Electromagnetic waves

5. The altitudinal distance of geostationary satellite from the earth is about .....(km).

(a) 26,000
(b) 30,000
(c) 56,000
(d) 36,000

6. The reflectance of a vegetation canopy is determined by which one of the following parameters.

(a) Solar zenith angle
(b) Azimuth angle
(c) Look angle
(d) All of the above

7. The infrared portion of EMR lies between

(a) 0.4–0.7 μm
(b) 0.5 mm to 1 μm
(c) 0.7–1.3 μm
(d) 0.7–1.4 μm

8. The square of standard deviation is known as

(a) Standard Error
(b) Range
(c) Coefficient of variation
(d) Variance

9. A rock body or formation which may be porous enough quantity of water but which by virtue of its other properties does not allow an easy and quick flow through it is called:

(a) Aquitard
(b) Aquifuge
(c) Aquiclude
(d) Aquifer

10. The range of chi square value is

(a) 0–8
(b) –1 to +1
(c) 0–1
(d) None of the above

11. Inversion that occurs near the earth's surface is called?

(a) Irradiance
(b) Radiance
(c) Exitance
(d) Radiant flux

12. A relative measure of variation estimated as the ratio of standard deviation to sample mean is

(a) Standard deviation
(b) Standard error
(c) Coefficient of variation
(d) Coefficient of correlation

13. Incomplete block design used in single factor experiment having a large number of treatment is

(a) CRD
(b) RBD
(c) Lattice design
(d) None if the above

14. Which latitude belt best describes the middle latitudes?

(a) 20° to 80°
(b) 30° to 50°
(c) 20° to 35°
(d) 40° to 70°

15. The ratio of the total solar radiant energy returned by a planetary body to the total radiant energy incident on the body is called:

(a) Albedo
(b) Reflectance factor
(c) Reflectance
(d) None of the above

16. In which of the year Crop acreage and Production Estimation (CAPE) was started in India?

(a) 1970
(b) 1983
(c) 2001
(d) 1985

17. The reflection of solar energy is characterized by the water content in the leaf, in the reflective optical range of

(a) Visible (0.4-0.7 μm) region
(b) Near-IR (0.7-1.3 μm) region
(c) Short wave-IR (1.3-2.7 μm) region
(d) None of the above

18. The NDVI is calculated as:

(a) (NIR + Red)/(NIR – Red)
(b) (NIR – Red)/(NIR + Red)
(c) $(NIR + Red)^2$
(d) $(NIR + Red)^2/(NIR - Red)$

19. Leaf reflectance depends primarily on

(a) Internal Cell Structure
(b) The pigments
(c) Equivalent water content
(d) All of the above

20. Which one the following helps to identify the objects on earth surface?

(a) Signature
(b) Atmospheric Window
(c) Radiometric Error
(d) None of the above

21. According to the Stefan-Boltzmann law, the radiative energy emitted by one square meter of an object is equal to a constant multiplied by its temperature raised to the _____ power.

(a) Negative third
(b) Zeroth
(c) Fourth
(d) Tenth

22. The half life of iodine 131 is:

(a) 30 years
(b) 15.7 years
(c) 5.6 years
(d) 8.03 years

23. In gas chromatography, the separation of the components of the volatile material is based upon

(a) Conductivity
(b) Molecular weight
(c) Partition coefficient
(d) Molarity

24. Thin layer chromatography is_____

(a) Adsorption chromatography
(b) Electrical mobility of ionic species
(c) Partition chromatography
(d) All of the above

25. Accumulation of which chemical in pelicans of Lake Michigan led to the formation of thin shells of their eggs?

(a) CFC
(b) PAN
(c) DDT
(d) PAC

In reverse phase chromatography, the stationary phase is:

(a) Polar
(b) Either polar or non polar
(c) Non polar
(d) None of the above

27. The Rf value indicates ratio of the distances travelled by

(a) Two solvents
(b) Solute to solvent
(c) Two solutes
(d) Solvent to solute

28. Which is the main criteria on which mass spectrometer is used for?

(a) Concentration of elements in the sample
(b) Properties of sample
(c) Relative mass of atoms
(d) Composition in sample

29. Which of the following is the function of flame or emission system in atomic absorption spectroscopy?

(a) To reduce the sample into atomic state
(b) To break the steady light into pulsating light
(c) To split the beam into two different beams
(d) To filter unwanted components

30. Separation of ions in mass spectrometer takes place on the basis of which of the following?

(a) Charge
(b) Mass
(c) Molecular weight
(d) Mass to charge ratio

31. Which of the following is generally used as radiation source in atomic absorption spectroscopy?

(a) Xenon Mercury arc lamp
(b) Tungsten lamp
(c) Hollow Cathode lamp
(d) Hydrogen discharge lamp

32. In flame emission photometers, the qualitative analysis is based upon which of the following.

(a) Intensity
(b) Velocity
(c) Color
(d) Frequency

33. The greatest advantage of grating mono-chromator is?

(a) Dispersion is overlapping
(b) Dispersion is non overlapping
(c) Dispersion occur in linear manner
(d) Dispersion occur in non linear manner

34. Which of the following is not a detector used in Flame emission photometers?

(a) Chromatogram
(b) Photronic cell
(c) Photovoltaic cell
(d) Photo emissive tube

35. Best medium used for the cultivation of Coliform group of organisms is

(a) Agar
(b) MAC-Conkey's Broth media
(c) Nutrient broth
(d) All of the above

36. Which of the following is the type of compound microscope?

(a) Electron microscope
(b) Bright field microscope
(c) Simple microscope
(d) None of the above

37. The autoclave works on the principle of

(a) Boyle's law
(b) Charles law
(c) Both (a) and (b)
(d) None of the above

38. Wakley Black method is used for the estimation of

(a) Cation Exchange Capacity
(b) Soil Organic Carbon
(c) Water Holding capacity
(d) Electrical Conductivity

39. The ability of a microscope to distinguish to adjacent objects as distinct and separate is:

(a) Focusing
(b) Resolution
(c) Magnification
(d) Rectification

40. ELISA test is used to

(a) Isolate DNA sequence
(b) Identify specific proteins
(c) Purity of proteins
(d) Separate viral RNA

41. The Average total rainfall is 100-150 cm in----------, located in Australia, South America and Africa.

(a) Tropical Savannas
(b) Chaparrals
(c) Deciduous Forest
(d) Temperate Forest

42. Which of the following is the most stable ecosystem?

(a) Forest
(b) Mountain
(c) Desert
(d) Ocean

43. Which of the following is not a detrivore?

(a) Vulture
(b) Earthworm
(c) Insects
(d) Hydrilla

44. A sharp line of distinction between the two biological communities is known as:

(a) Ecotype
(b) Ecotone
(c) Ecad
(d) None of the above

45. Secondary succession begins at:

(a) Base rock
(b) Newly cooled lava
(c) Burnt forest
(d) Newly created shallow pond

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46. Functional role of organism in an ecological system is

(a) Habitat
(b) Niche
(c) Population
(d) Community

47. The total area of productive ecosystem required to support a population sustainably is known as:

(a) Ecological footprint
(b) Ecological handprint
(c) Ecological services
(d) All of the above

48. The species which are confined to a particular country/region are called

(a) Epidemic species
(b) Keystone species
(c) Extinct species
(d) Endemic species

49. Which of the following is the most productive ecosystem?

(a) Lakes and streams
(b) Estuaries
(c) Continental shelf
(d) Open ocean

50. A measure that combines the number of species and their relative abundances compared with one another is termed as:

(a) Species richness
(b) Species evenness
(c) Species diversity
(d) Species relationships

51. Kaziranga National Park is famous for

(a) Elephants
(b) Musk Deer
(c) Tigers
(d) Rhinoceros

52. Which of the following is not biodiversity hotspot?

(a) Eastern Himalaya
(b) Indo Burma Region
(c) Western Himalaya
(d) Western Ghats

53. Which of the following is an ex situ mode of wildlife conservation?

(a) Sacred conservation
(b) Home gardens
(c) National Parks
(d) Biosphere reserve

54. Which plant is known as the gasoline plant?

(a) *Salvadora persica*
(b) *Euphorbia lathyris*
(c) *Thevetia peruviana*
(d) *Sterculia foetida*

55. MAB program stands for

(a) Man and Biotechnology
(b) Material and Biology
(c) Man and Biology
(d) Man and Biosphere

56. The process of the successive establishment of a species is

(a) Sere
(b) Reaction
(c) Biosis
(d) Ecesis

57. IUCN (International Union for Conservation of Nature and Natural Resources) headquarter is at:

(a) Morges, Switzerland
(b) Paris, France
(c) Vienna, Austria
(d) New York, USA

58. The organisms in different geographical regions but occupying same niche are called

(a) Ecological polyvalents
(b) Ecological equivalents
(c) Ecological monovalents
(d) Ecological pyramids

59. Hotspots are the regions of high

(a) Rarity
(b) Endemism
(c) Critically endangered population
(d) Diversity

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60. Thermal belts are usually found

(a) on valley floors
(b) on hillsides
(c) on mountain tops
(d) on foot hills

61. Cement factory labours are prone to _____

(a) Leukemia
(b) Bone marrow disease
(c) Asbestosis
(d) Cytosilicosis

62. The earth's radiation is often referred to as _____radiation, while the sun's radiation is often referred to as _____radiation.

(a) shortwave, longwave
(b) shortwave, shortwave
(c) longwave, shortwave
(d) longwave, longwave

63. The source of Stratospheric NO_x is

(a) Atmospheric N_2
(b) Tropospheric N_2O
(c) Tropospheric NO
(d) Tropospheric NO_2

64. Which of the following are responsible for ozone layer depletion?

(a) CCl_4
(b) Chlorofluroethane
(c) Chlorolead
(d) Chloroflurocarbon

65. Which one of the following methods converts decomposed liquid or solid hazardous organic waste effectively?

(a) Open incineration
(b) Plasma incineration
(c) Sanitary landfill
(d) Bioremediation

66. _____ is used as indicators of SO_2 pollution of air.

(a) Liverwort
(b) Epiphytic Lichens
(c) Fern
(d) Cornwart

67. Ozone and PAN exert their biochemical effect via producing

(a) Carbonium ion
(b) Ozonide
(c) H-ions
(d) Free radicals

68. Dobson unit is the measurement of

(a) Concentration of trace gases in atmosphere
(b) Concentration of ozone in stratosphere
(c) Green house potential of gases
(d) Relative toxicity of heavy metals

69. *Itai-Itai* disease is related to which of the following

(a) Cadmium
(b) Mercury
(c) Zinc
(d) Iron

70. Fugitive emissions consist of

(a) Street dust
(b) Dust from construction activities
(c) Dust from farm cultivation
(d) All of the above

71. Which of the following is a secondary aerosol?

(a) Pollens
(b) Virus
(c) Sodium chloride
(d) Ammonium Sulphate

72. Which of the following is responsible for Minamata disease?

(a) Phenyl mercury
(b) Methyl mercury
(c) Inorganic mercury
(d) Benzyl mercury

73. Who discovered the Green House Effect?

(a) D.E. Vocx
(b) Joseph Fourier
(c) Charles Dufay
(d) Waldemir Komaro

74. Montreal protocol is related to

(a) CH_4
(b) O_3
(c) CO_2
(d) NO_x

75. IPCC came into existence in:

(a) 1965
(b) 1988
(c) 1978
(d) 1998

76. Which gas is having 21 times more global warming potential than CO_2?

(a) N_2O
(b) SO_2
(c) NH_3
(d) CH_4

77. Which of the following is used as an antiknock agent in gasoline?

(a) Tetramethyl lead
(b) Tetraethyl lead
(c) Triethyl lead
(d) Trimethyl lead

78. The maximum permissible limit of nitrate in drinking water is

(a) 100 g/litre
(b) 20 mg/litre
(c) 75 mg/litre
(d) 50 mg/litre

79. _____ are a group of pollutants known as environment estrogen.

(a) Dioxins
(b) Vinyl chloride
(c) Mercaptans
(d) Carbamates

80. Heavy metals have a density of

(a) 10 g/cc
(b) 15 g/cc
(c) 5 g/cc
(d) 2 g/cc

81. Which of the following state constituted green bench?

(a) Kerala
(b) Assam
(c) Tamil Nadu
(d) Madhya Pradesh

82. The first protected area in India is

(a) Bandipur Sanctuary
(b) Silent Valley
(c) Corbett National Park
(d) Nanda Devi

83. During the winter in the Northern Hemisphere, the "land of the midnight sun" would be found:

(a) at high latitudes
(b) at middle latitudes
(c) near the equator
(d) on the West Coast

84. BOD means

(a) Biological Oxygen Deficit
(b) Biochemical Oxygen Demand
(c) Biotic Oxygen Demand
(d) All of the above

85. Which of the following gases has low residence time?

(a) Carbon dioxide
(b) Nitrous oxide
(c) CFCs
(d) Methane

86. How does the BOD get affected with increase in organic matter in water:

(a) The oxygen demand increases

(b) The oxygen demand decreases

(c) The oxygen demand remains unchanged

(d) None of the above

87. Which of the following statement is incorrect?

(a) Chromium (VI) is highly toxic

(b) Methyl mercury is most toxic form of mercury

(c) Arsenic (III) is more toxic than arsenic (V)

(d) Cadmium is a criteria pollutant

88. Highly toxic oxidation state of Arsenic is

(a) As^{2+} (b) As^{6+}

(c) As^{3+} (d) As^{+}

89. Salinity of sea water is

(a) 3.5% (b) 4.9%

(c) 6.5% (d) 1.4%

90. The solar cell is made up of following elements.

(a) Iron (b) Bauxite

(c) Silicon (d) Nickel

91. Thermo nuclear reactions are better known as

(a) Nuclear Fission (b) Neutron emission

(c) Neutron Fusion (d) Nuclear Fusion

92. Which article has the provisions of environmental protection in the Indian constitution?

(a) Article 27-B
(b) Article 21-B
(c) Article 48-A
(d) Article 5-A

93. Wildlife protection act came into existence in the year

(a) 1962
(b) 1970
(c) 1980
(d) 1972

94. Under which section of Wildlife (Protection) Act, 1972, the state government can declare an area closed to hunting for a specific period.

(a) Section 35
(b) Section 27
(c) Section 38-A
(d) Section 37

95. International Biodiversity Day" is celebrated on :

(a) 22 March
(b) 22 April
(c) 22 February
(d) 22 May

96. In which year the Ganga Action Plan was started?

(a) 1972
(b) 1992
(c) 1980
(d) 1985

97. Environmental Impact Assessment was incorporated under which legislation?

(a) Air (Prevention and Control of Pollution) Act, 1981
(b) Wildlife (Protection) Act,1981
(c) Indian Forest Act, 1927
(d) Environmental (Protection) Act, 1986

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98. Decade of sustainable development is

(a) 2001–10

(b) 1991–2000

(c) 2005–2014

(d) 1981–1990

99. The earth is tilted at an angle of 23.5° with respect to the plane of its orbit around the sun. If the amount of tilt was increased to 40°, what would we expect in middle latitudes?

(a) Hotter summers and colder winters

(b) Cooler summers and milder winters

(c) Hotter summers and milder winters

(d) Cooler summers and colder winters

100. The Earth Summit of Rio de Janeiro (1992) resulted in

(a) IUCN

(b) Conservation of Biological Diversity

(c) Compilation of Red List

(d) Establishment of Biosphere Reserves

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