SET 2016

PAPER – III

ENVIRONMENTAL SCIENCE

Signature of the Invigilator

Question Booklet No. 160428

1.

OMR Sheet No.. .....

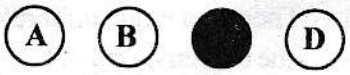
Subject Code 16 **Roll No.**

Time Allowed : 150 Minutes **Max. Marks : 150**

No. of pages in this Booklet : **12** No. of Questions : **75**

INSTRUCTIONS FOR CANDIDATES

1. Write your Roll No. and the OMR Sheet No. in the spaces provided on top of this page.
2. Fill in the necessary information in the spaces provided on the OMR response sheet.
3. This booklet consists of seventy five (75) compulsory questions each carrying 2 marks.
4. Examine the question booklet carefully and tally the number of pages/questions in the booklet with the information printed above. **Do not accept a damaged or open booklet**. Damaged or faulty booklet may be got replaced within the first **5** minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time given.
5. Each Question has four alternative responses marked (A), (B), (C) and (D) in the OMR sheet. You have to completely darken the circle indicating the most appropriate response against each item as in the illustration.



6. All entries in the OMR response sheet are to be recorded in the original copy only.
7. Use only Blue/Black Ball point pen.
8. Rough Work is to be done on the blank pages provided at the end of this booklet.
9. If you write your Name, Roll Number, Phone Number or put any mark on any part of the OMR Sheet, except in the spaces allotted for the relevant entries, which may disclose your identity, or use abusive language or employ any other unfair means, you will render yourself liable to disqualification.
10. You have to return the Original OMR Sheet to the invigilators at the end of the examination compulsorily and must not carry it with you outside the Examination Hall. **You are, however, allowed to carry the test booklet and the duplicate copy of OMR Sheet** on conclusion of examination.
11. Use of any calculator, mobile phone or log table etc. is strictly prohibited.
12. **There is no negative marking.**

SEAL

16-16

PAPER-III
ENVIRONMENTAL SCIENCE

1. Which of the following belong to the category of primary consumers ?
   (A) Snakes and Frogs
   (B) Butterflies and Cattle
   (C) Eagle and Snake
   (D) Ladybird and Lacewing

2. Which one of the following is a secondary pollutant ?
   (A) Carbon dioxide
   (B) Carbon monoxide
   (C) Ozone
   (D) Sulphur dioxide

3. Bacteria play an important role in the carbon cycle as some of them exhibit :
   (i) Chemosynthesis
   (ii) Photosynthesis
   (iii) Respiration
   Choose the correct answer
   (A) (iii)
   (B) (i) & (iii)
   (C) (ii) & (iii)
   (D) (i), (ii) & (iii)

4. Number of seismograph stations needed to locate the epicenter of an earthquake is :
   (A) One
   (B) Two
   (C) Three
   (D) Four

5. 'Life cycle analysis' involves :
   (A) Evaluation of all the environmental impacts of a product from the time the raw materials are gathered to their ultimate disposal
   (B) Evaluation of the difference in the amount of environmental impacts caused by individuals from different parts of the world
   (C) The amount of environmental degradation that the average person creates within their lifetime, expressed in monetary terms
   (D) The area of biosphere required to sustain an individual, company/organisation of country

6. The dry adiabatic lapse rate is :
   (A) 0.1°C per km
   (B) 1°C per km
   (C) 4°C per km
   (D) 10°C per km

7. Reasons that the population size of an exotic species often grows rapidly when the species is introduced in a new environment include which of the following?
   I. The exotic species is resistant to pesticides.
   II. There is a large, underutilized food source in the new environment.
   III. The exotic species has few natural predators in the new environment.
   Choose the correct answer
   (A) I only
   (B) I and III only
   (C) II and III only
   (D) I, II, and III

8. Deep ocean currents are largely driven by
   (A) relative humidity in the surrounding atmosphere
   (B) prevailing winds
   (C) mid-ocean ridge volcanism
   (D) temperature and salinity gradients

9. Which of the following cause the most severe dispersion in a clay soil ?
(A) very concentrated solution of NaCl
(B) very dilute solution of NaCl
(C) very concentrated solution of $CaCl_2$
(D) very dilute solution of $CaCl_2$

10. Which one of the following is not a characteristic feature of r-selected species?
(A) Maturity at later stage
(B) Large clutch size
(C) Small size of offsprings
(D) Maturity at early stage of life

11. Organisms representative of the limnetic zone are
(A) microscopic plankton
(B) frogs and their tadpoles
(C) worms, insect larvae and crayfish
(D) cattails and other emergent vegetation

12. Which of the following distinctive processes that controls the development of a community during ecological succession can be defined as 'establishment of the initial bare surface'?
(A) Migration
(B) Nudation
(C) Ecesis
(D) Stabilization

13. Which substances are regulated by the Kyoto Protocol?
I. argon
II. carbon dioxide
III. nitrogen
IV. nitrous oxide
V. sulfur hexafluoride
Choose the correct answer
(A) I, II and III only
(B) I and III only
(C) II and V only
(D) II, IV and V only

14. Which one of the following statements is true for a Multipurpose river valley project?
(A) It can store the entire rain water received in a region
(B) It fragments rivers, which makes it difficult for aquatic fauna to migrate
(C) It will not affect the cropping pattern of a region
(D) It will not affect the natural flow of a river

15. The patterns of convection currents near the equator are called :
(A) Coriolis cells
(B) El Niño events
(C) Hadley cells
(D) High-pressure cells

16. Hot spots are primarily designated on the basis of
(A) Above ground biodiversity
(B) Below ground biodiversity
(C) Species diversity
(D) Endemism

17. The Water (Prevention and Control) Pollution Act came into force in the year
(A) 1972
(B) 1974
(C) 1977
(D) 1981

18. The world's most abundant fossil fuel is
(A) biodiesel
(B) coal
(C) methane
(D) hydrogen gas

19. Continents have drifted apart because of
(A) volcanic eruptions
(B) tectonic activities
(C) folding and faulting of rocks
(D) landslides

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20. "Dead animal → blow fly maggots → common frog → snake" is a
(A) Decomposer food chain
1. (B) Detrital food chain
(C) Grazing food chain
(D) Predator food chain

21. The Coriolis effect contributes to
(A) global warming
(B) increase in eutrophication
(C) decrease in eutrophication
2. (D) global wind pattern

22. The most abundant, natural acid is:
(A) nitric acid
(B) hydrochloric acid
(C) carbonic acid
(D) citric acid

3. 23. Cement factory workers are prone to
(A) Asbestosis
(B) Leukemia
(C) Cytosilicosis
(D) Anaemia

24. Clay minerals are formed of
(A) Aluminium and Silicon
(B) Calcium and Aluminium
(C) Calcium and Sodium
(D) Sodium and Potassium

25. Which element in chlorofluorocarbons (CFCs) is
4. responsible for destroying the Earth's ozone layer ?
(A) oxygen
(B) fluorine
(C) bromine
(D) chlorine

26. Which of the following pairs contains one igneous and one sedimentary rock?
(A) granite and limestone
(B) obsidian and gneiss
(C) sandstone and quartzite
(D) shale and marble

27. Which one of the following is the correct percentage of the two (out of the total of 4) green house gases that contribute to the total global warming?
(A) CO_2 40%,CFCs 30%
(B) N_2O 6%,$CO_2$86%
(C) Methane 20%, N_2O 18%
(D) CFCs 14%, Methane 20%

28. Hematite is a primary ore of
(A) zinc
(B) tungsten
(C) iron
(D) calcium

29. The electricity-generating power plant that releases radioactive materials as well as toxic metals such as lead and arsenic under normal operating conditions is
(A) Nuclear
(B) Geothermal
(C) Hydroelectric
(D) Solar

30. Based on flower morphology and chemical constituents which one of the following is widely believed to be co-evolved with insects ?
(A) Cereals
(B) Legumes
(C) Orchids
(D) Ferns

41. "Ecological gradient" refers to

1

(A) the Competitive Exclusion Principle

(B) the variation in the number of species from the equator to the poles

(C) change in the relative abundance of a species over an area

(D) increasing extinction of species through time

42. Life tables are useful in determining

2.

I. carrying capacity

II. mortality rates

III. the fate of a cohort of newborn organisms throughout their lives

Choose the correct answer

(A) I only

(B) II only

(C) I and II only

3.

(D) II and III only

43. The logistic population growth model, $dN/dt = rN[(K- N)/K]$, describes a population's growth when an upper limit to growth is assumed. This upper limit to growth is known as the population's carrying capacity. As N gets larger, dN/dt

(A) increases

(B) decreases

(C) remains unchanged

(D) increases or decreases based on relative humidity

4.

44. Percentage of forest cover recommended by the National Forest Policy (1988) is

(A) 20% for plains and 70% for hills

(B) 23% for plains and 77% for hills

(C) 37% for plains and 63% for hills

(D) 33% for plains and 67% for hills

45. Species that occur in different geographical regions separated by special barrier are

(A) Allopatric

(B) Sympatric

(C) Anthropogenic

(D) Eutrophic

46. The term Alpha diversity refers to

(A) Community and ecosystem diversity

(B) Diversity among the plants

(C) Genetic diversity

(D) Species diversity

47. Most of the Earth's deserts are at approximately 30° latitude, north and south, because these latitudes are characterized by

(A) descending dry air currents

(B) predominantly low atmospheric pressure

(C) enhanced solar radiation

(D) slow-moving jet streams

48. Match the following and choose the correct one from the code below

1. Basel Convention	(i) Wetlands
2. Montreal	(ii) Climatic change
3. Kyoto Protocol	(iii) On substances that deplete the ozone layer
4. Ramsar Convention	(iv) Transboundary movement of hazardous waste

	1	2	3	4
(A)	(iii)	(i)	(ii)	(iv)
(B)	(iii)	(iv)	(i)	(ii)
(C)	(iii)	(i)	(iv)	(ii)
(D)	(iv)	(iii)	(ii)	(i)

49. Match the following and choose the correct one from the code below'

1. Ranthambore	(i) Elephant
2. Gir	(ii) Bengal Tiger
3. Kanchanjanga	(iii) Asiatic Lion
4. Bandipur	(iv) Rhinoceros

	1	2	3	4
(A)	(ii)	(iii)	(iv)	(i)
(B)	(iii)	(iv)	(i)	(ii)
(C)	(iii)	(i)	(iv)	(ii)
(D)	(iv)	(iii)	(ii)	(i)

50. The difference between a threatened species and an endangered species is

(A) A threatened species and an endangered species are the same.

(B) A threatened species means that the population is likely to become endangered. An endangered species is already extinct.

(C) A threatened species means that the population is likely to become endangered. An endangered species has population numbers so low that it is likely to become extinct.

(D) A threatened species is already extinct. An endangered species means that the population's numbers have increased greatly over the last 5 years.

51. Quantity of salicylic acid (Molecular weight - 138) required to prepare 100 ppm solution is

(A) 1.38 g

(B) 138 g

(C) 138 mg

(D) 100 mg

52. The Rio Earth Summit was held in

(A) 1972

(B) 1982

(C) 1992

(D) 2012

53. An association of individuals of different species living in the same habitat and having functional interactions is

(A) Biotic community

(B) Ecologic niche

(C) Population

(D) Ecosystem

54. Insectivorous plants are adapted to soils

(A) Deficient in water

(B) Deficient in nitrogenous compounds

(C) Deficient in phosphorus compounds

(D) Deficient in ecofriendly soil insects

55. 'Spatial filtering' in remote sensing means

(A) altering the position of pixels in an image because of inconsistencies in the relationship between sensor and surface during data collection.

(B) preparing parts of the image at a different scale to another part of the image.

(C) splitting a scene into separate constituent parts and focusing on a smaller section to increase the resolution.

(D) selectively preserving certain pixel frequencies in an image to enhance particular features or edges of objects.

56. Which one of the following microorganism is referred to as the superbug that cleans up oil spills ?
(A) *Bacillus denitrificans*
(B) *Bacillus subtilis*
(C) *Pseudomonas denitrificans*
(D) *Pseudomonas putida*

57. Walkley and Black method is used for determining
(A) Total dissolved oxygen
(B) Total suspended particulate matter
(C) Total dissolved solids
(D) Total organic carbon

58. What is the name of a species that is highly connected to the entire food web and whose loss may result in ecosystem collapse?
(A) Top species
(B) Vital species
(C) Limiting species
(D) Keystone species

59. The single most important item that can be recycled is
(A) newspapers
(B) plastic milk bags
(C) aluminum cans
(D) glass jars

60. As per Biomedical Waste (Management & Handling) Rules 1998, the maximum time beyond which waste can not be stored is:
(A) 12 hours
(B) 72 hours
(C) 48 hours
(D) 96 hours

61. Sustainable development is
(A) new building work to maintain jobs
(B) to build green buildings
(C) to employ typical 21st century farming methods
(D) to improve our lives without damaging the quality of life of future generations

62. H_2 is a promising alternative fuel as it does not produce any greenhouse gases. Approximate number of molecules present in 1.0 kg of H_2 are
(A) 3.0×10^{23}
(B) 6.0×10^{23}
(C) 3.0×10^{26}
(D) 6.0×10^{26}

63. In an aquatic ecosystem, the trophic level equivalent to cows in grasslands is
(A) Benthos
(B) Nekton
(C) Phytoplankton
(D) Zooplankton

64. Given below are two statements, one labelled as Assertion (A) and the other labelled as Reason (R).
Assertion (A) : Nobody can claim a fundamental right to create noise pollution by amplifying the sound of his speech with the help of a loudspeaker.
Reason (R) : While one has a right to speech, others have a right to listen or decline to listen. Anyone who wishes to live in peace, comfort and quiet within his house has a fundamental right to prevent the noise as pollution reaching him.
Choose the correct answer from the following:
(A) (A) and (R) are true. (R) is good explanation of (A).
(B) Both (A) and (R) are true, but (R) is not a good explanation of (A).
(C) (A) is true, (R) is false.
(D) (A) is false, (R) is true.

65. On false-colour infrared images living plants appear
(A) White
(B) Black
(C) Blue
(D) Red

66. The term 'spatial filtering' in remote sensing means
(A) Changing the position of pixels in an image because of inconsistencies in the relationship between sensor and surface during data collection
(B) Making parts of the image at a different scale to another part of the image
(C) Selectively preserving certain pixel frequencies in an image to enhance particular features or edges of objects
(D) Separating a scene into separate constituent parts and focusing on a smaller section to increase the resolution

67. All of the following apply to the concept of the extinction vortex except
(A) The genetic variability of the species' population decreases
(B) The key factor driving the extinction vortex is intraspecific competition
(C) Interbreeding leads to smaller populations, which leads to more interbreeding
(D) Populations of the species entering it are small

68. Which of the following is TRUE of an earthquake's epicenter and focus?
(A) The epicenter is at the earth's surface
(B) The focus is above the epicenter
(C) The focus is at the earth's inner core
(D) They are the same

69. The CITES treaty has been helpful in protecting endangered animals and plants by
(A) specifying prices for certain plant and animal products
(B) listing those species and products whose international trade is controlled
(C) funding projects for breeding endangered plants and animals
(D) preventing the hunting of whales and dolphins

70. An impact assessment, whether health impact assessment, environmental impact assessment, social impact assessment, environmental technology assessment should be
(A) Prospective
(B) Retrospective
(C) Apathetic
(D) Subjective

71. Fish collected from water body adjacent to an industry, which was unlawfully releasing its effluents into it, showed 27, 23, 15, 18, 30, 24, 8, 12 and 16 mg/kg body weight of Cd. The median in this series is
(A) 15
(B) 16
(C) 18
(D) 19.2

72. If, X joules of nuclear energy is used to produce Y joules of electrical energy, then
(A) $X > Y$
(B) $X \geq Y$
(C) $X < Y$
(D) $X \leq Y$

73. What are the two main types of data in a GIS?
(A) Environmental and Engineering
(B) Vector and Raster
(C) Tables and Maps
(D) Pictures and Graphics

74. If earthquake 'A' has a Richter magnitude of 7 compared to 6 of earthquake 'B', the amount of ground motion measure of earthquake intensity is
(A) 'A' is 10 times more intense than 'B'
(B) 'A' is 100 times more intense than 'B'
(C) 'A' is 1000 times more intense than 'B'
(D) Richter magnitude does not measure intensity

75. Which of the following can trigger a tsunami?
(i) undersea earthquakes
(ii) undersea landslides
(iii) the eruption of an oceanic volcano
Choose the correct answer
(A) (i) & (ii)
(B) (i) & (iii)
(C) (ii) & (iii)
(D) (i), (ii) & (iii)