

**SET 2013**  
**PAPER – III**

**ENVIRONMENTAL SCIENCE**

Signature of the Invigilator

Question Booklet No. ....

1.

OMR Sheet No.. ....

**Subject Code**

**ROLL No.**

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**Time Allowed : 150 Minutes**

**Max. Marks : 150**

**No. of pages in this Booklet : 11**

**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.**

**16-13**

**ENVIRONMENTAL SCIENCE  
PAPER – III**

**Note :** This paper contains **seventy five (75)** objective type questions of **two (2)** marks each.

**All** questions are compulsory.

1. Which of the following maintain the heat budget of the Earth significantly ?
  - (A) Nitrogen and Oxygen
  - (B) Ozone and Carbon dioxide
  - (C) Water vapour and Ozone
  - (D) Water vapour and Carbon dioxide
2. Which one of the following is measured in Dobson units ?
  - (A) PAN
  - (B) CFC
  - (C) Ozone
  - (D) PAH
3. The fermentation is generally carried out at :
  - (A) 30-35°C
  - (B) 25-30°C
  - (C) 10-30°C
  - (D) 20-30°C
4. Average diameter of tropical cyclone is about :
  - (A) 300 miles
  - (B) 75 miles
  - (C) 25 miles
  - (D) 5 miles
5. Parameter Important Unit (PIU) is :
  - (A) A subjective process
  - (B) A weightage to the parameters
  - (C) A technique to select the parameters
  - (D) None of the above
6. Atmosphere contains various layers each having characteristics composition. The correct sequence starting from the earth's surface is :
  - (A) Stratosphere → Ionosphere → Troposphere
  - (B) Troposphere → Ionosphere → Stratosphere
  - (C) Ionosphere → Stratosphere → Troposphere
  - (D) Troposphere → Stratosphere → Ionosphere
7. Alpha diversity represents :
  - (A) Species richness
  - (B) Species richness and evenness
  - (C) Species evenness
  - (D) Species richness and dominance
8. In deep oceans the phenomenon of inverted biomass pyramid occurs mainly due to :
  - I. Fast growth rate and high nutrient requirement of producers
  - II. Rapid turnover rate and short life span of producers
  - III. Slow growth rate and high nutrient requirement of herbivores
  - IV. Slow turnover and long life span of herbivoresWhich of the following combinations is correct ?
  - (A) I and III
  - (B) I and IV
  - (C) II and III
  - (D) II and IV
9. The concentration of Total Dissolved Solids (TDS) in drinking water should not exceed :
  - (A) 500 mg/L
  - (B) 400 mg/L
  - (C) 300 mg/L
  - (D) 200 mg/L
10. Trait attributes of *r*-selection species are :
  - (A) Seed number : High ; Seed size : Small ; Life span : Short
  - (B) Seed number : Low ; Seed size : Large ; Life span : Long
  - (C) Seed number : Low ; Seed size : Large ; Life span : Short
  - (D) Seed number : High ; Seed size : Large ; Life span : Long

11. Zone of lake where production is greater than respiration is :  
 (A) Profundal  
 (B) Limnetic  
 (C) Benthic  
 (D) Littoral
12. Geophytes are plants that have potential to survive under :  
 (A) Arid conditions with the help of underground storage organs  
 (B) Humid conditions with the help of underground storage organs  
 (C) Arid conditions by producing large number of seeds  
 (D) Humid conditions by producing large number of seeds
13. Which of the following has the highest Global warming potential ?  
 (A) CO<sub>2</sub>  
 (B) Water vapour  
 (C) CFCs  
 (D) NO<sub>2</sub>
14. What type of dam is Tehri dam ?  
 (A) Landfill  
 (B) Rockfill  
 (C) Sand  
 (D) Muddy
15. To which of the following parameters Multispectral Scanner band V(0.6-0.7 μm) and band VI (0.7-0.8 μm) is sensitive ?  
 (A) Water  
 (B) Vegetation density  
 (C) Soil density  
 (D) Rock density
16. The two hot spots in India are :  
 (A) Eastern Himalayas and Eastern Ghats  
 (B) Northeast and Sunderban delta  
 (C) Western Ghats and Eastern Himalayas  
 (D) Northeast and Western Ghats
17. Forest (Conservation ) Act, 1980 was amended in:  
 (A) 1989  
 (B) 1988  
 (C) 1990  
 (D) 1999
18. Geothermal energy may serve as an important source of energy in :  
 (A) Tehri town  
 (B) Ladakh district  
 (C) Konkan district  
 (D) Aravallis
19. The phenomenon of polar vortex is related with :  
 (A) Cold wind in U.P  
 (B) Chilling weather in Delhi  
 (C) Ozone depletion in Antarctica  
 (D) Snowfall in Srinagar
20. Which of the following is a detritus food chain ?  
 (A) Trees → Insect larvae → Beetles → Earthworm  
 (B) Phytoplanktons → Insects → Small fish → Larger fish → Crocodile  
 (C) Herbs → Insects → Frog → Snake → Peacock  
 (D) Grass → Rabbit → Fox → Wolf → Tiger
21. The harmful gas is reduced in car exhaust emissions by using a catalytic converter :  
 (A) Carbon dioxide  
 (B) Nitrogen oxide  
 (C) Nitrogen  
 (D) Hydrogen sulphide
22. Rainwater always contains small amounts of the weakly acidic gas carbon dioxide dissolved from air. What happens to the pH of rainwater when it runs over limestone rock ?  
 (A) The pH rises from 7 to 10  
 (B) The pH rises from 5.5 to 8  
 (C) The pH rises from 3 to 5.5  
 (D) The pH falls from 5.5 to 3

23. A pollutant that is produced from the incomplete combustion of a fossil fuel is :
- Nitrogen dioxide
  - Sulphur dioxide
  - Nitrogen
  - Carbon monoxide
24. Which one of the following statements is TRUE about soil ?
- Plant roots tend to break up soil and cause erosion
  - Humus is formed from organic material and is rich in nutrients
  - Clay soil has plenty of air in it and thriving with living organisms
  - Sandy soil has small rock particles and is poorly drained
25. Which of the following most likely provides evidence of global warming ?
- Increased ice sheet area at the South Pole
  - Increased biodiversity in the Atlantic Ocean
  - Decrease in ice sheet area at the North Pole
  - Decrease in ice sheet area at the South Pole
26. Which is TRUE about sedimentary rocks ?
- Hard wearing, not easily weathered, even by acid rain
  - The red of sandstone is usually due to calcium compounds
  - Limestone does not readily fizz with acid
  - Limestone is made of carbonate minerals
27. Which of the following explains the 'Greenhouse Effect' ?
- Decrease in carbon dioxide in the atmosphere allows more ultraviolet radiation to reach the Earth's surface
  - Increase in the ozone layer decreases the amount of ultraviolet radiation that reaches the Earth's surface
  - Decrease in the ozone layer allows more heat radiation to reach the Earth's surface
  - Increase in carbon dioxide in the atmosphere traps more heat radiation from the Earth
28. Which is TRUE about igneous rocks ?
- Fast cooling of lava makes small crystal grains
  - Soft and readily weathered
  - Fast cooling of lava underground makes pumice stone
  - Formed from the effects of heat and pressure on metamorphic rocks
29. Stanley Miller in his experiment used the gases :
- $\text{NH}_3$ ,  $\text{H}_2$ ,  $\text{CH}_4$ ,  $\text{H}_2\text{O}$
  - $\text{NH}_3$ ,  $\text{CO}_2$ ,  $\text{HCN}$
  - $\text{NH}_3$ ,  $\text{CH}_4$ ,  $\text{H}_2$ ,  $\text{O}_2$
  - $\text{NH}_3$ ,  $\text{H}_2$ ,  $\text{CO}_2$ ,  $\text{N}$
30. Leghemoglobin, like hemoglobin, has  $\text{O}_2$  binding capacity. This is associated with :
- Nodulated roots of legumes
  - Leaves of legumes
  - Bacteroids in legumes
  - Non-nodulated portion of legume roots
31. Which of the following is brood parasite ?
- Koel
  - Damselfly
  - Dolphin
  - Pigeon
32. A species introduced into a new geographical area is called :
- Exotic
  - Endemic
  - Cosmopolitan
  - None of the above
33. Which one of the following is widely used as a biopesticide ?
- Bacillus thurengensis*
  - Agrobacterium tumefaciens*
  - Escherichia coli*
  - Xanthomonas oryzae*

34. What is the salinity of seawater (on average) in parts per thousand (ppt) ?  
 (A) 0.1 ppt  
 (B) 6 ppt  
 (C) 936 ppt  
 (D) 36 ppt
35. Using radioactive decay, the age of the rocks can be ascertained. This method employs radioactive decay of:  
 (A) Carbon – 14  
 (B) Phosphorus – 32  
 (C) Potassium – 40  
 (D) Uranium – 238
36. Why are estuaries more productive than either the river that flows into them or the sea that receives the water ?  
 (A) The nutrients are recycled back into the estuary due to the colder sea water flowing back up the estuary and recycling the mineralized nutrients  
 (B) The quantity of bacteria on the sea grasses is so large it makes the biomass production very high  
 (C) The estuary water is colder than the river  
 (D) The estuary is wider and more shallow than the river and therefore heats up more
37. Which of the following water borne pathogen is a bacteria ?  
 (A) *Entamoeba*  
 (B) *Giardia*  
 (C) *Salmonella*  
 (D) *Ascaris*
38. *Yersinia pestis* is causative agent of :  
 (A) Plague  
 (B) Elephantiasis  
 (C) Sleeping sickness  
 (D) Yellow fever
39. Interaction where both species are benefitted but the association is not obligatory :  
 (A) Ammensalism  
 (B) Commensalism  
 (C) Protocooperation  
 (D) Mutualism
40. The common thing between *Nepenthes*, *Darlingtonia*, *Dionea* and *Utricularia* is :  
 (A) They are parasites  
 (B) They are endangered species  
 (C) They are carnivorous plants  
 (D) None of the above
41. Hypervolume niche is concerned with :  
 (A) Physical space occupied by the organism  
 (B) Functional role of the organism  
 (C) Trophic position of the organism  
 (D) Position of organism in environmental gradient
42. Human beings exhibit which type of survivorship curve ?  
 (A) Highly convex  
 (B) Diagonal  
 (C) Sigmoid  
 (D) Highly concave
43. In logistic equation  $dN/dT = rN(1-N/K)$ ,  $r$  represents :  
 (A) Environmental resistance  
 (B) Carrying capacity  
 (C) Biotic potential  
 (D) Growth rate
44. If  $D$  = detector dimension,  $F$  = Focal Length,  $H$  = Flying height, then Ground Resolution Element (GRE) is equal to :  
 (A)  $(D/F) \times H$   
 (B)  $D/F$   
 (C)  $H/F$   
 (D)  $D/H$

45. In Autogenic succession :
- P/R ratio = 1 throughout the event
  - P/R ratio is less than 1 throughout the event
  - P/R ratio is more than 1 throughout the event
  - P/R ratio is more than 1 initially but with progress it equals to one
46. During seral stages of succession :
- P/B ratio < 1
  - P/R ratio = 1
  - P/B ratio > 1
  - $P \times B = 1$
47. Secchi disc is used to measure :
- Water salinity
  - Water turbidity
  - Acidity
  - Alkalinity
48. Match the following and choose the correct one from the codes below :
- |                                    |                              |
|------------------------------------|------------------------------|
| 1. Tropical semi-evergreen forest  | (i) Allapalli, Maharashtra   |
| 2. Tropical moist deciduous forest | (ii) Ramnagar, Uttar Pradesh |
| 3. Littoral and swamp forest       | (iii) Palghat, Kerala        |
| 4. Tropical dry deciduous forest   | (iv) Sunderban, West Bengal  |
- Codes :**
- |     |       |      |       |      |
|-----|-------|------|-------|------|
|     | 1     | 2    | 3     | 4    |
| (A) | (iii) | (i)  | (ii)  | (iv) |
| (B) | (iii) | (iv) | (i)   | (ii) |
| (C) | (iii) | (i)  | (iv)  | (ii) |
| (D) | (iv)  | (ii) | (iii) | (i)  |
49. Which of the following is not a correct match ?
- Kaziranga sanctuary- Assam
  - Bharatpur bird sanctuary- Rajasthan
  - Keibul Lamjao national park- Mizoram
  - Namdapha national park- Arunachal Pradesh
50. Trees shed their leaves in winter season to :
- Escape being eaten by animals
  - Conserve heat
  - Take rest summer growth
  - Conserve water
51. One nanometer is equivalent to :
- $10^{-3}$ m
  - $10^{-3}$ cm
  - $10^{-6}$ m
  - $10^{-9}$ m
52. Ramsar Convention on wetlands was signed in 1971 in :
- India
  - Canada
  - U.S.A.
  - Iran
53. Mycorrhizae represent :
- A parasitic association of a fungi with roots of higher plants
  - A symbiotic association between cyanobacteria and higher plants
  - A symbiotic association between cyanobacteria and fungus
  - A symbiotic association after fungus with the roots of higher plants
54. Velamen tissue is present in :
- Prop roots
  - Stilt roots
  - Pneumatophores
  - Hanging roots of epiphytes
55. UV radiations are injurious to living beings because they :
- Increase respiration
  - Cause dehydration
  - Break phosphate bonds
  - Cause genetic aberrations

56. Organisms, other than bacteria and fungi, that feed on dead organic matter are known as :
- Folivores
  - Consumers
  - Detritivores
  - Decomposers
57. Winkler method is used for determination of :
- Dissolved oxygen
  - Dissolved carbon dioxide
  - Total dissolved solids
  - Salinity
58. Which one of the following is true about incineration of solid waste ?
- Incinerators are relatively cheap to build
  - There is drastic reduction in the volume and weight of waste
  - Incinerators can be built to generate electricity
  - The ash can contain heavy metals and other toxic substances
59. Which category of solid waste requires disinfection and autoclaving ?
- Domestic waste
  - Biomedical waste
  - Waste paper
  - None of the above
60. Phase 2 liability audit refers to which of the following ?
- Collecting information from interviews
  - Detailed physical sampling and testing of contaminants in laboratories
  - Establishing a contractual relationship with potential supplier or a joint-venture partner
  - All of the above
61. Which of the following steps is not a part of Phase III in Waste audit ?
- To identify obvious waste reduction options
  - To target and characterize problem waste
  - To investigate the possibility of waste segregation
  - Prepare and organize audit team and resources
62. Given below are two statements, one labelled as Assertion (A) and the other labelled as Reason (R)
- Assertion (A) :** The right to clean drinking water and right to free air to breathe are attributes of the right to life
- Reason (R) :** Because they are the basic elements which sustain life
- Choose the correct answer from the following :
- Both (A) and (R) are true. (R) is good explanation of (A)
  - Both (A) and (R) are true, but (R) is not a good explanation of (A)
  - (A) is true, (R) is false
  - (A) is false, (R) is true
63. Given below are two statements, one labelled as Assertion (A) and the other labelled as Reason (R)
- Assertion (A) :** The greatest losses of life and infrastructure are found whenever there is a combination of intense energy release along the earthquake fault and high levels of human vulnerability
- Reason (R) :** The fatalities at Bhuj and Ahmedabad were so high because the earthquake occurred at a shallow depth directly underneath populated places where most of the people were in structurally weak houses
- Choose the correct answer from the following :
- Both (A) and (R) are true. (R) is good explanation of (A)
  - Both (A) and (R) are true, but (R) is not a good explanation of (A)
  - (A) is true, (R) is false
  - (A) is false, (R) is true

64. Which of the following is correct about attribute data in Geographical Information System ?
- (A) Attributes are pieces of data that are connected or related to the points, lines, or polygons mapped in the GIS
- (B) Attribute data can be analyzed to determine patterns of importance
- (C) Attribute data is entered directly into a database where it is associated with element data
- (D) All of these are correct
65. In India, an Environmental Impact Assessment report of a proposed river valley project after environmental clearance is applicable for a maximal period of how many years ?
- (A) Two
- (B) Five
- (C) Ten
- (D) Thirty
66. Given below are two statements, one labelled as Assertion (A) and the other labelled as Reason (R)
- Assertion (A) :** Indirect impacts are more difficult to measure, but can ultimately be more important
- Reason (R) :** In areas where wild game is plentiful, such as Africa, new roads often lead to the rapid depletion of animals due to poaching
- Choose the correct answer from the following :
- (A) Both (A) and (R) are true and (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
67. Earthquake waves in which particles follow an elliptical path in the direction of propagation and partly in the vertical plane are known as :
- (A) Primary waves
- (B) Secondary waves
- (C) Rayleigh waves
- (D) Love waves
68. Which rare earth element is not present in the earth's crust but for commercial purpose comes from the Nuclear reactors ?
- (A) Promethium
- (B) Lanthanum
- (C) Cerium
- (D) Samarium
69. In Murli Deora Vs Union of India and Ors AIR 2002 SC 40 it was held that :
- (A) Non smokers should not be compelled to be victims of Air Pollution
- (B) Children below 15 years of age should not be employed as labour
- (C) Pregnant women should not be employed as labour
- (D) Fetal sex determination should not be allowed
70. The Central Pollution Control Board and the State Pollution Control Boards function is the implementation of the :
- (A) Water (Prevention and Control of Pollution) Act
- (B) Air (Prevention and Control of Pollution) Act
- (C) Both (A) and (B)
- (D) Environment (Protection) Act
71. Which one of the following is not a measure of central tendency of a frequency distribution ?
- (A) Mode
- (B) Mean
- (C) Mean deviation
- (D) Median

72. An Environmental NGO collected 720 bags of solid waste from colonies A, B and C. Twice as many bags were collected from Colony A compared to Colony B. Three times as many bags were collected from Colony C compared to Colony B. The number of bags collected from Colony C was :
- (A) 120
  - (B) 240
  - (C) 360
  - (D) 480
73. To display Green colour in the monitor the amount of RGB should be :
- (A) 255:0:0
  - (B) 255:255:255
  - (C) 0:0:0
  - (D) 0:255:0
74. The Deep pocket theory developed by the Supreme Court envisages that :
- (A) Measure of compensation must be correlated with the magnitude and capacity of the enterprise to pay damages
  - (B) Government should pay maximum compensation to accident victims because in a democracy government belongs to the people
  - (C) Persons convicted of serious corruption charges should not be allowed to contest elections
  - (D) None of the above
75. The uneven distribution of solar radiation, plus the pull of gravity on Earth produces :
- (A) Ocean currents and winds
  - (B) Earthquakes and volcanic eruptions
  - (C) Mass extinctions
  - (D) The greenhouse effect

## **ROUGH WORK**

## ROUGH WORK