PAPER-III
ENVIRONMENTAL SCIENCES

Signature and Name of Invigilator

1. (Signature) _____

   (Name) _____

2. (Signature) _____

   (Name) _____

| J | 8 | 9 | 1 | 6 |

Time : **2 ½ hours**]

OMR Sheet No. : ....

(To be filled by the Candidate)

Roll No. [ ][ ][ ][ ][ ][ ][ ][ ]

(In figures as per admission card)

Roll No._____

(In words)

[Maximum Marks : **150**

| Number of Pages in this Booklet : **16** | Number of Questions in this Booklet : **75** |

Instructions for the Candidates

1. Write your roll number in the space provided on the top of this page.
2. This paper consists of seventy five multiple-choice type of questions.
3. At the commencement of examination, the question booklet will be given to you. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as below :
   (i) To have access to the Question Booklet, tear off the paper seal on the edge of this cover page. Do not accept a booklet without sticker-seal and do not accept an open booklet.
   (ii) **Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faulty booklets due to pages/questions missing or duplicate or not in serial order or any other discrepancy should be got replaced immediately by a correct booklet from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given.**
   (iii) After this verification is over, the Test Booklet Number should be entered on the OMR Sheet and the OMR Sheet Number should be entered on this Test Booklet.
4. Each item has four alternative responses marked (1), (2), (3) and (4). You have to darken the circle as indicated below on the correct response against each item.
   Example : ① ② ● ④
   where (3) is the correct response.
5. Your responses to the items are to be indicated in the **OMR Sheet given inside the Booklet only.** If you mark your response at any place other than in the circle in the OMR Sheet, it will not be evaluated.
6. Read instructions given inside carefully.
7. Rough Work is to be done in the end of this booklet.
8. If you write your Name, Roll Number, Phone Number or put any mark on any part of the OMR Sheet, except for the space allotted for the relevant entries, which may disclose your identity, or use abusive language or employ any other unfair means, such as change of response by scratching or using white fluid, you will render yourself liable to disqualification.
9. 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 original question booklet and duplicate copy of OMR Sheet on conclusion of examination.
10. Use only Black Ball point pen provided by C.B.S.E.
11. Use of any calculator or log table etc., is prohibited.
12. There is no negative marks for incorrect answers.

परीक्षार्थियों के लिए निर्देश

1. इस पृष्ठ के ऊपर नियत स्थान पर अपना रोल नम्बर लिखिए ।
2. इस प्रश्न-पत्र में पचहत्तर बहुविकल्पीय प्रश्न हैं ।
3. परीक्षा प्रारम्भ होने पर, प्रश्न-पुस्तिका आपको दे दी जायेगी । पहले पाँच मिनट आपको प्रश्न-पुस्तिका खोलने तथा उसकी निम्नलिखित जाँच के लिए दिये जायेंगे, जिसकी जाँच आपको अवश्य करनी है :
   (i) प्रश्न-पुस्तिका खोलने के लिए पुस्तिका पर लगी कागज की सील को फाड़ लें । खुली हुई या बिना स्टीकर-सील की पुस्तिका स्वीकार न करें ।
   (ii) **कवर पृष्ठ पर छपे निर्देशानुसार प्रश्न-पुस्तिका के पृष्ठ तथा प्रश्नों की संख्या को अच्छी तरह चैक कर लें कि ये पूरे हैं । दोषपूर्ण पुस्तिका जिनमें पृष्ठ/प्रश्न कम हों या दुबारा आ गये हों या सीरियल में न हों अर्थात किसी भी प्रकार की त्रुटिपूर्ण पुस्तिका स्वीकार न करें तथा उसी समय उसे लौटाकर उसके स्थान पर दूसरी सही प्रश्न-पुस्तिका ले लें । इसके लिए आपको पाँच मिनट दिये जायेंगे । उसके बाद न तो आपकी प्रश्न-पुस्तिका वापस ली जायेगी और न ही आपको अतिरिक्त समय दिया जायेगा ।**
   (iii) इस जाँच के बाद प्रश्न-पुस्तिका का नंबर OMR पत्रक पर अंकित करें और OMR पत्रक का नंबर इस प्रश्न-पुस्तिका पर अंकित कर दें ।
4. प्रत्येक प्रश्न के लिए चार उत्तर विकल्प (1), (2), (3) तथा (4) दिये गये हैं । आपको सही उत्तर के वृत्त को पेन से भरकर काला करना है जैसा कि नीचे दिखाया गया है :
   उदाहरण : ① ② ● ④
   जबकि (3) सही उत्तर है ।
5. प्रश्नों के उत्तर केवल प्रश्न पुस्तिका के अन्दर दिये गये OMR पत्रक पर ही अंकित करने हैं । यदि आप OMR पत्रक पर दिये गये वृत्त के अलावा किसी अन्य स्थान पर उत्तर चिह्नांकित करते हैं, तो उसका मूल्यांकन नहीं होगा ।
6. अन्दर दिये गये निर्देशों को ध्यानपूर्वक पढ़ें ।
7. कच्चा काम (Rough Work) इस पुस्तिका के अन्तिम पृष्ठ पर करें ।
8. यदि आप OMR पत्रक पर नियत स्थान के अलावा अपना नाम, रोल नम्बर, फोन नम्बर या कोई भी ऐसा चिन्ह जिससे आपकी पहचान हो सके, अंकित करते हैं अथवा अभद्र भाषा का प्रयोग करते हैं, या कोई अन्य अनुचित साधन का प्रयोग करते हैं, जैसे कि अंकित किये गये उत्तर को मिटाना या सफेद स्याही से बदलना तो परीक्षा के लिये अयोग्य घोषित किये जा सकते हैं ।
9. आपको परीक्षा समाप्त होने पर मूल OMR पत्रक निरीक्षक महोदय को लौटाना आवश्यक है और परीक्षा समाप्ति के बाद उसे अपने साथ परीक्षा भवन से बाहर न लेकर जायें । हालांकि आप परीक्षा समाप्ति पर मूल प्रश्न-पुस्तिका तथा OMR पत्रक की डुप्लीकेट प्रति अपने साथ ले जा सकते हैं ।
10. **केवल C.B.S.E. द्वारा प्रदान किये गये काले बाल प्वाईंट पेन का ही इस्तेमाल करें ।**
11. किसी भी प्रकार का संगणक (कैलकुलेटर) या लाग टेबल आदि का प्रयोग वर्जित है ।
12. गलत उत्तरों के लिए कोई नकारात्मक अंक नहीं हैं ।

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P.T.O.

ENVIRONMENTAL SCIENCES
PAPER – III

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

1. A stream with a flow rate of 0.2 m^3/s and a chloride concentration of 50 mg/L receives a discharge of mine drainage water with a flow rate of 0.05 m^3/s and chloride concentration of 1500 mg/L. The downstream concentration of chloride is
   (1) 450 mg/L   (2) 200 mg/L
   (3) 250 mg/L   (4) 340 mg/L

2. Reclamation of Usar soil can be done by
   (a) addition of gypsum
   (b) addition of compost
   (c) blue green algal biofertilizer use
   (d) addition of inorganic nitrogenous fertilizer
   Choose the correct code :
   (1) (a) and (b) only   (2) (a), (b) and (d) only
   (3) (a), (b) and (c) only   (4) (a) only

3. The equilibrium reaction $N_2 + O_2 \rightleftharpoons 2NO$ is characterised by
   (a) decrease in the Gibbs free energy of forward reaction
   (b) increase in the Gibbs free energy of the backward reaction
   (c) minimum Gibbs free energy at equilibrium
   (d) change in Gibbs free energy to be zero at equilibrium
   Choose the correct code :
   (1) (a) only   (2) (a) and (b) only
   (3) (a), (c) and (d) only   (4) (c) only

4. In profundal zone, P and R ratio, $\left(\dfrac{P}{R}\right)$ is
   (1) > 1   (2) < 1
   (3) = 1   (4) ≥ 0.1

5. Consider the following statements about deritovores :
   (a) They consume the organic matter originating from plant remains.
   (b) They consume the organic matter originating from animal remains.
   (c) They are abundant in aquatic habitats.
   (d) They are abundant in terrestrial habitats.
   Choose the correct code :
   (1) (a) and (d) only   (2) (b) and (d) only
   (3) (c) and (d) only   (4) (a), (b), (c) and (d)

6. The Box model for an airshed over a city has the following parameter values :

      Length of the airshed (L) = 24 km

      Average wind speed (μ) = 4 m/s

If the initial concentration of a pollutant over the city is zero, estimate the time in which the concentration of the pollutant in the airshed reaches ~ 63% of its final value.

  (1)   1 hr 10 minutes   (2)   1 hr 20 minutes

  (3)   2 hrs 30 minutes   (4)   1 hr 40 minutes

7. Match the List-I and List-II. Identify the correct answer from the codes given below :

	List – I		**List – II**
	(Organic compound)		**(Source)**
a.	Terpene	i.	Ruminants
b.	Methane	ii.	Soil
c.	Humic acid	iii.	Coal tar
d.	Benzo [a] pyrene	iv.	Plants

Codes :

	a	b	c	d
(1)	i	ii	iii	iv
(2)	iv	i	ii	iii
(3)	iv	iii	ii	i
(4)	ii	i	iii	iv

8. Among the following taxonomic groups which one has the least number of known species ?

  (1)   Nematodes   (2)   Fungi

  (3)   Porifera   (4)   Insecta

9. At the average surface temperature of the earth, what is the wavelength at which maximum terrestrial radiation are emitted ?

  (1)   ~ 8.08 μm   (2)   ~ 11.52 μm

  (3)   ~ 10.06 μm   (4)   ~ 3.48 μm

10. About ~ 97% of all atmospheric mass in the atmosphere lies upto an approximate height of

  (1)   ~ 10 km   (2)   ~ 15 km

  (3)   ~ 20 km   (4)   ~ 30 km

11. Which of the following materials is the most efficient absorber of terrestrial and solar radiation ?

  (1)   Suspended dust particles   (2)   Ice particles

  (3)   Fly ash particles   (4)   Black carbon particles

12. An infinitesimal air parcel rises slowly upwards in the atmosphere. In this context, which of the following statements is <u>not</u> correct ?

(1) Heat change, dq is zero.

(2) Internal energy decreases.

(3) Temperature during ascent decreases.

(4) Lapse rate has a negative numerical value.

13. Given below are two statements. One labelled as Assertion (A) and the other labelled as Reason (R) :

Assertion (A) : The ratio $^{18}O/_{16}O$ in natural systems can be used as a thermometer.

Reason (R) : The ratio $^{18}O/_{16}O$ depends on the temperature.

Choose the correct answer :

(1) Both (A) and (R) are correct and (R) is the correct explanation of (A).

(2) Both (A) and (R) are correct and (R) is not the correct explanation of (A).

(3) (A) is true, but (R) is false.

(4) (A) is false, but (R) is true.

14. Ecosphere comprises of the following :

(1) Biosphere and Troposphere.

(2) Biosphere, Troposphere and Hydrosphere.

(3) Biosphere, Hydrosphere and Lithosphere.

(4) Biosphere, Atmosphere, Hydrosphere and Lithosphere.

15. Given below are two statements. One labelled as Assertion (A) and the other labelled as Reason (R) :

Assertion (A) : In an exponential growth phase of the Logistic growth model, the population growth is maximum.

Reason (R) : After a lag phase, the population is well supported by environmental resources.

Choose the correct answer :

(1) Both (A) and (R) are correct and (R) is the correct explanation of (A).

(2) Both (A) and (R) are correct and (R) is not the correct explanation of (A).

(3) (A) is true, but (R) is false.

(4) (A) is false, but (R) is true.

16. An anemometer at a height of 10 m above the ground measures a wind speed of 0.5 m/s. For a neutral atmosphere with wind profile exponent p = 0.25, the wind speed at an elevation of 160 m will be

(1)   1 m/s   (2)   ~ 1.8 m/s

(3)   0.5 m/s   (4)   2.5 m/s

17. In Leslie matrix model, the dynamics of a population explains

(a)   growth of the population

(b)   decreasing trend in the population

(c)   stable condition

Choose the correct code :

(1)   (a) and (b) only   (2)   (b) and (c) only

(3)   (a) and (c) only   (4)   (a), (b) and (c)

18. In the initial stages of landfill, which of the following gas is predominantly released ?

(1)   Carbon dioxide   (2)   Methane and Ammonia

(3)   Methane   (4)   Hydrogen Sulphide

19. Match the List – I and List – II. Identify the correct answer from the codes given below :

	List – I		**List – II**
	(Goal)		**(Statistical test)**
a.	To quantify association between two variables with normal distribution	i.	Mean and standard deviation
b.	To compare two unpaired groups under non-normal distribution	ii.	Pearson correlation
c.	To compare three or more unmatched groups in binomial distribution	iii.	Mann-Whitney test
d.	To describe a group of data under normal distribution	iv.	χ^2 test

Codes :

	a	b	c	d
(1)	i	ii	iii	iv
(2)	ii	iii	iv	i
(3)	iii	iv	i	ii
(4)	iv	i	ii	iii

20. A sampling error of 2.5758 σ; where σ is the standard deviation along with critical value of 2.5758 represents the significance level of

(1) 5.0%   (2) 1.0%

(3) 2.7%   (4) 4.55%

21. In random samples of 64 boats out of a total 2400 boats, the mean number of defective boats is 3.2 with a sample standard deviation 0.8. The standard error of the mean is

(1) ~ 0.107   (2) ~ 0.40

(3) ~ 0.97   (4) ~ 0.097

22. The Compensatory Afforestation Fund (CAF) was started by Government of India in the year

(1) 2002   (2) 2004

(3) 2006   (4) 2008

23. According to CRZ notification 2011, which of the following activities is permissible in CRZ-I ?

(1) Removal of mangroves for housing activities.

(2) Storage of hazardous cargo.

(3) Pipelines, conveying systems including transmission lines.

(4) Reclamation of salt marshes and nesting grounds.

24. Among the following methods, the most cost effective method for treating the infectious waste from hospitals is

(1) Autoclaving   (2) Deep burial

(3) Incineration   (4) Fumigation

25. Match the List – I and List – II. Identify the correct answer from the codes given below :

	List – I (Protocols/Acts)		**List – II** (Subject)
a.	Nagoya Protocol	i.	Intellectual Property Rights
b.	Air (Pollution Prevention and Control) Act, 1981	ii.	Biodiversity
c.	Indian Patent Act, 1970	iii.	Noise Pollution
d.	Environmental Protection Act, 1986	iv.	Environmental Audit

Codes :

	a	b	c	d
(1)	i	ii	iii	iv
(2)	ii	i	iv	iii
(3)	ii	iii	i	iv
(4)	iii	iv	ii	i

26. According to the Wildlife (Protection) Act, 1972, permission for hunting of a rogue animal which is dangerous to human life can be granted only by

(1) Chief Wildlife Warden

(2) Conservator of Forests

(3) Deputy Conservator of Forests

(4) Chief Secretary of the Government

27. Match the List – I and List – II. Identify the correct answer from the codes given below :

	List – I		**List – II**
	(Ecolabels)		**(Country)**
a.	Green Seal	i.	India
b.	Blue Angel	ii.	USA
c.	Eco-mark	iii.	Belgium
d.	Eco Garantie	iv.	Germany

Codes :

	a	b	c	d
(1)	ii	iv	i	iii
(2)	iii	i	ii	iv
(3)	iv	ii	iii	i
(4)	i	iii	iv	ii

28. Overgrazing of public land by privately owned livestock is an example of

(1) right of the grazing domain
(2) principle of empowerment

(3) tragedy of the commons
(4) swapping of debt for nature

29. Social, economic and ecological equity is the necessary condition for achieving

(1) social development
(2) economic development

(3) sustainable development
(4) ecological development

30. A management system enabling an establishment to identify and control the environmental impacts due to its activities

(1) ISO 14020
(2) ISO 14001

(3) ISO 14004
(4) ISO 19011

31. Match the List – I and List – II. Identify the correct answer from the codes given below :

	List – I (Principle/Process)		List – II (Objectives)
a.	Cradle to grave	i.	Economic strategy for pollution control
b.	Polluter pays	ii.	Environmental impact of production, use and disposal
c.	Precautionary principles	iii.	Cleaner production
d.	Waste prevention and minimization	iv.	Cost effective measures to prevent environmental degradation

Codes :

	a	b	c	d
(1)	i	ii	iii	iv
(2)	ii	i	iv	iii
(3)	iii	iv	i	ii
(4)	iv	i	ii	iii

32. Match the List – I and List – II. Identify the correct answer from the codes given below :

	List – I (Steps in EIA)		List – II (Description)
a.	Impact prediction	i.	Environmental status of an area
b.	Baseline data collection	ii.	Hazard probability
c.	Decision making	iii.	Impact assessment authority
d.	Risk assessment	iv.	Reversible and irreversible impacts

Codes :

	a	b	c	d
(1)	ii	iii	i	iv
(2)	iii	iv	ii	i
(3)	iv	i	iii	ii
(4)	i	ii	iv	iii

33. Match the List – I and List – II. Identify the correct answer from the codes given below :

	List – I (EIA Methods)		List – II (Developed by)
a.	Interaction Matrix	i.	J. Sorenson
b.	Environmental Evaluation System	ii.	D. Carsten
c.	Network Method	iii.	L.B. Leopold
d.	Descriptive Checklist	iv.	Battelle Columbus

Codes :

	a	b	c	d
(1)	i	ii	iii	iv
(2)	iii	iv	ii	i
(3)	iii	iv	i	ii
(4)	iv	i	ii	iii

34. Which of the following in soil is an essential micronutrient ?

(1) Nitrogen   (2) Calcium

(3) Magnesium   (4) Chlorine

35. Match the List – I and List – II. Identify the correct answer from the codes given below :

	List – I		List – II
	(Pollutant)		(Ambient Indian Standards 24 hrs.)
a.	NO_2	i.	$60\ \mu g/m^3$
b.	$PM_{2.5}$	ii.	$80\ \mu g/m^3$
c.	Ammonia	iii.	$100\ \mu g/m^3$
d.	PM_{10}	iv.	$400\ \mu g/m^3$

Codes :

	a	b	c	d
(1)	ii	i	iv	iii
(2)	i	iii	iv	ii
(3)	iii	iv	ii	i
(4)	iv	ii	iii	i

36. Coral bleaching observed in marine environment is caused by

(1) sea floor rise.

(2) decline in zooxanthellae due to climate change.

(3) addition of bleaching powder by ships.

(4) death of fishes due to toxic algal blooms.

37. Ultrafilteration does not allow which of the following to pass through ?

(1) Small organic molecules   (2) Colloidal particles

(3) Viruses   (4) Bacteria

38. Consider dry atmosphere which has temperatures of 14.5 °C and 12.5 °C at elevations of 2 m and 252 m, respectively. The atmosphere is :

(1) conditionally unstable   (2) unstable

(3) neutral   (4) stable

39. An electrostatic precipitator has collection efficiency of 98% for fine particles of a dirty gas. Its collection area of plates is 50 m^2 and gas flow rate is 20 m^3/s. If the migration velocity of the particles is changed by 0.1 m/s by changing the electric field, what will be the change in collection efficiency ?

(1)   0.05   (2)   0.10

(3)   0.005   (4)   0.001

40. A person is exposed to two sound levels of 80 dB and 100 dB simultaneously. What is the average noise level the person experiences ?

(1)   ~ 97 dB   (2)   ~ 87 dB

(3)   ~ 90 dB   (4)   ~ 93 dB

41. An ocean wave of 2 m height has a time period of 10 sec. Approximate power associated with per meter of wavefront is

(1)   ~ 40 kW m^{-1} (2)   ~ 20 kW m^{-1}

(3)   ~ 80 kW m^{-1} (4)   ~ 2.5 kW m^{-1}

42. Given below are two statements. One labelled as Assertion (A) and the other labelled as Reason (R) :

Assertion (A) : Presence of moisture in biomass often leads to significant loss in useful thermal output.

Reason (R)   : Evaporation of water requires significant amount of energy.

Choose the correct answer :

(1)   Both (A) and (R) are correct and (R) is the correct explanation of (A).

(2)   Both (A) and (R) are correct and (R) is not the correct explanation of (A).

(3)   (A) is true, but (R) is false.

(4)   (A) is false, but (R) is true.

43. For thermonuclear fusion to occur what must be the minimum confinement time of the hot plasma of ion density 10^{22} per m^3 ?

(1)   10 μs   (2)   1 ms

(3)   100 μs   (4)   10 ms

44. An insolation of 1000 W/m^2 is incident on a single Si solar cell of area 80 cm^2. Assuming that 5% of photons create electron-hole pairs and that the average energy of the photons is 1 eV. What is the short circuit current of the cell ?

(1)   1.6 A   (2)   0.8 A

(3)   0.4 A   (4)   3.2 A

45. A tidal estuary of tidal range 5 m has an area of water trapped 10 km^2. If we assume density of water 10^3 kg/m^3 and g = 9.8 m/s^2, what is the maximum theoretical energy available per cycle ?

(1) 24.5×10^{11} J
(2) 12.25×10^{11} J
(3) 24.5×10^8 J
(4) 12.25×10^{10} J

46. Among the following types of fuel cells, which one has the lowest operating temperature ?

(1)   Solid oxide
(2)   Proton-exchange membrane
(3)   Molten carbonate
(4)   Phosphoric acid

47. Given below are two statements. One labelled as Assertion (A) and the other labelled as Reason (R) :

Assertion (A) : Global warming potential for nitrous oxide is similar whether expressed over 20 years or 100 years.

Reason (R)   : The life time of nitrous oxide in atmosphere is about 10 years.

Choose the correct answer :

(1)   Both (A) and (R) are correct and (R) is the correct explanation of (A).
(2)   Both (A) and (R) are correct and (R) is not the correct explanation of (A).
(3)   (A) is true, but (R) is false.
(4)   (A) is false, but (R) is true.

48. Suppose the world's energy consumption per year grows exponentially at a growth rate of 2% per year. In how much time, the energy consumption per year will double from the present value ?

(1)   ~ 35 years
(2)   ~ 70 years
(3)   ~ 50 years
(4)   ~ 40 years

49. Eutrophication in inland wetlands such as lakes is caused by

(1)   enrichment of water by chlorides
(2)   enrichment of water by phosphates
(3)   addition of detritus
(4)   silt from the catchment

50. Parameters used in the computation of urban Air Quality Index are

(1) $PM_{2.5}$, NO_x, SO_x and Pb
(2) PM_{10}, BTX, CO, NO_x, SO_x and Cl
(3) PM_{10}, $PM_{2.5}$, NO_2, Pb, NH_3, CO and SO_2
(4) PM_{10}, $PM_{2.5}$, NO_2, SO_2, CO, O_3, NH_3 and Pb

51. Identify the correct order of aquatic ecosystems based on their primary productivity

    (1)   reservoir < river < marsh < swamp

    (2)   marsh < swamp < reservoir < river

    (3)   swamp < marsh < reservoir < river

    (4)   river < reservoir < marsh < swamp

52. Adaptive management of an ecosystem restoration programme involves

    (1)   conservation programme for a finite period.

    (2)   top-down approach.

    (3)   monitoring, review and mid-course correction.

    (4)   implementation and monitoring of a conservation plan.

53. For estimation of inundated areas which spectral region is best suited ?

    (1)   Visible   (2)   Near infra-red

    (3)   Far infra-red   (4)   Microwave

54. What percentage of water on earth is fresh water (liquid/solid form) ?

    (1)   ~ 7.5%   (2)   ~ 3.5%

    (3)   ~ 2.5%   (4)   ~ 1.5%

55. The maximum velocity of Indian Plate is observed in

    (1)   Kathmandu   (2)   Maldives

    (3)   Kolkata   (4)   Daman and Diu

56. Tropical cyclones develop as a result of balance between forces of

    (1)   Pressure gradient force ($|\vec{P}_n|$) and centrifugal force ($|\vec{C}_f|$)

    (2)   ($|\vec{P}_n|$) and coriolis force ($|\vec{C}_H|$)

    (3)   ($|\vec{C}_f|$) and ($|\vec{C}_H|$)

    (4)   ($|\vec{C}_H|$), ($|\vec{P}_n|$) and frictional force

57. Match the List – I and List – II. Identify the correct answer from the codes given below :

	List – I (Rock type)		List – II (Mineral)
a.	Bailadila group	i.	Mn
b.	Nallamalai group	ii.	Phosphate
c.	Udaipur group	iii.	BIF
d.	Sausar group	iv.	Pb-Zn

Codes :

	a	b	c	d
(1)	iii	iv	ii	i
(2)	iv	ii	iii	i
(3)	ii	iii	iv	i
(4)	iii	iv	i	ii

58. Match the List – I and List – II. Identify the correct answer from the codes given below :

	List – I (Rock/Minerals)		List – II (Chemical Composition)
a.	Quartz	i.	Fe_3O_4
b.	Magnetite	ii.	CaF_2
c.	Fluorite	iii.	SiO_2
d.	Calcite	iv.	$CaCO_3$

Codes :

	a	b	c	d
(1)	iii	i	ii	iv
(2)	iv	iii	i	ii
(3)	ii	iv	iii	i
(4)	i	ii	iv	iii

59. The sum of deep sub-surface and delayed shallow surface flows in humid climate is known as

(1) Sub-surface flow   (2) Base flow

(3) Pipe flow   (4) Inter flow

60. Urban heat island effect can best be monitored in the following spectral region

(1) $1 - 3 \, \mu m$ (2) $3 - 5 \, \mu m$

(3) $10 - 12 \, \mu m$ (4) $3 - 6 \, \mu m$

61. The final seral stage of succession is governed by which of the following concepts ?

(1) Seral climax   (2) Poly climax

(3) Null climax   (4) Micro climax

62. In a natural ecosystem pollination pertains to
   (1)   supporting services   (2)   regulating services
   (3)   cultural services   (4)   provisioning services

63. Balanoglossus – a unique protochordata is conserved in marine protected areas of
   (1)   Saint Mary's Island   (2)   Jambudweep Island
   (3)   Car Nicobar Island   (4)   Kurusadai Island

64. A group of species, that make their living by exploiting the same class of resources in a similar way, is known as
   (1)   Pride   (2)   Guild
   (3)   Bunch   (4)   Herd

65. In comparison to C_3 plants, the C_4 plants are adapted to
   (1)   low light and low temperature.
   (2)   bright light and high temperature.
   (3)   low light and medium temperature.
   (4)   very low light and average temperature.

66. The life style that an organism pursues and the resources it utilizes, is referred to as
   (1)   Fundamental niche   (2)   Realized niche
   (3)   Actualized niche   (4)   Mechanized niche

67. The evolution of two interacting species, each in response to selection pressure imposed by the other is called
   (1)   Coevolution   (2)   Adaptation
   (3)   Mitigation   (4)   Mutualism

68. Methanogenesis occurs in natural aquatic environments at a redox potential of about
   (1)   – 200 mV   (2)   + 150 mV
   (3)   + 250 mV   (4)   – 300 mV

69. Which of the following trace atmospheric constituents has no natural source ?
   (1)   Methyl bromide   (2)   Dimethyl sulfide
   (3)   Carbonyl sulfide   (4)   Trichlorofluoromethane

70. Given below are two statements. One labelled as Assertion (A) and the other labelled as Reason (R) :

Assertion (A) : High temperature makes N_2 and O_2 to react and produce pollutant NO.

Reason (R)   : The reaction $N_2 + O_2 \rightleftharpoons$ is exothermic.

Choose the correct answer :
   (1)   Both (A) and (R) are correct and (R) is the correct explanation of (A).
   (2)   Both (A) and (R) are correct and (R) is not the correct explanation of (A).
   (3)   (A) is true, but (R) is false.
   (4)   (A) is false, but (R) is true.

71. In a cuvette of path length 1.0 cm, a 0.01 M solution of a compound is filled. If the transmittance of the solution be 50%, what is its absorbance ?

(1) 6.90

(2) 2.00

(3) 0.50

(4) 0.30

72. Match the List – I and List – II. Identify the correct answer from the codes given below :

	List – I		List – II
	(Analysis)		**(Instruments)**
a.	Protein	i.	Gravimetry
b.	SO_x, NO_x	ii.	Flame photometry
c.	Sulphate	iii.	Electrophoresis
d.	Sodium	iv.	Spectrophotometry

Codes :

	a	b	c	d
(1)	iii	iv	i	ii
(2)	i	ii	iii	iv
(3)	ii	iii	iv	i
(4)	iv	i	ii	iii

73. Which one of the following is not a Phase-I reaction component in biotransformation of pesticides ?

(1) Oxidation

(2) Conjugation

(3) Reduction

(4) Hydrolysis

74. Solubilization and transport of iron in natural water is generally done by

(1) Humin

(2) Fulvic acid

(3) Humic acid

(4) EDTA

75. In a water body suffering from mercury pollution, the most toxic species among the following is

(1) Mercurous ion

(2) Mercuric ion

(3) Methylmercury cation

(4) Dimethylmercury

Space For Rough Work