

Roll No.

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(Write Roll Number from left side exactly as in the Admit Card)

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Signature of Invigilator

Question Booklet Series

X

PAPER-II

Question Booklet No.

(Identical with OMR
Answer Sheet Number)

Subject Code : 33

ENVIRONMENTAL SCIENCES

Time : 2 Hours

Maximum Marks: 200

Instructions for the Candidates

- Write your Roll Number in the space provided on the top of this page as well as on the OMR Sheet provided.
- At the commencement of the examination, the question booklet will be given to you. In the first 5 minutes, you are requested to open the booklet and verify it:
 - To have access to the Question Booklet, tear off the paper seal on the edge of this cover page.
 - Faulty booklet, if detected, should be got replaced immediately by a correct booklet from the invigilator within the period of 5 (five) minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given.
 - Verify whether the Question Booklet No. is identical with OMR Answer Sheet No.; if not, the full set is to be replaced.
 - After this verification is over, the Question Booklet Series and Question Booklet Number should be entered on the OMR Sheet.
- This paper consists of One hundred (100) multiple-choice type questions. All the questions are compulsory. Each question carries *two* marks.
- Each Question has four alternative responses marked: (A) (B) (C) (D). You have to darken the circle as indicated below on the correct response against each question.

Example: (A) (B) (C) (D), where (C) is the correct response.
- Your responses to the questions are to be indicated correctly in the OMR Sheet. If you mark your response at any place other than in the circle in the OMR Sheet, it will not be evaluated.
- Rough work is to be done at the end of this booklet.
- If you write your Name, Phone Number or put any mark on any part of the OMR Sheet, except in 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.
- Do not tamper or fold the OMR Sheet in any way. If you do so, your OMR Sheet will not be evaluated.
- You have to return the Original OMR Sheet to the invigilator at the end of the examination compulsorily and must not carry it with you outside the Examination Hall. You are, however, allowed to carry question booklet and duplicate copy of OMR Sheet after completion of examination.
- Use only Black Ball point pen.
- Use of any calculator, mobile phone, electronic devices/gadgets etc. is strictly prohibited.
- There is no negative marks for incorrect answer.

(ENVIRONMENTAL SCIENCES)

1. The first World Conference on Human and Environment by UN was held in the year

- (A) 1965
- (B) 1972
- (C) 1976
- (D) 1982

2. Ramsar Convention was signed on

- (A) February 2, 1971
- (B) February 2, 1972
- (C) February 2, 1975
- (D) February 2, 1970

3. World Ozone Day is observed on

- (A) September 15
- (B) September 16
- (C) October 16
- (D) December 16

4. The book "The fall of a sparrow" was written by

- (A) Charles Darwin
- (B) Salim Ali
- (C) Ralph Emerson
- (D) E O Wilson

5. When did life origin on Earth?

- (A) 4.6 billion years ago
- (B) 3.5 billion years ago
- (C) 3.5 million years ago
- (D) 1.5 million years ago

6. Namami Ganga Plan was launched to accomplish the objectives of

- (i) Conservation of Ganga water
- (ii) Rejuvenation of Ganga
- (iii) Effective reduction of pollution in Ganga
- (iv) Implementation of laws to prevent effluent discharge directly in Ganga

Choose the correct answer:

- (A) (i), (ii) and (iv)
- (B) (i), (ii) and (iii)
- (C) (ii), (iii) and (iv)
- (D) (i), (iii) and (iv)

7. Which of the following statements related to C/N ratio is *not* correct?

- (A) Lower initial C/N ratio leads to loss of nitrogen and slows down the rate of decomposition
- (B) Higher initial C/N ratio leads to cell destruction to obtain nutrition
- (C) Higher initial C/N ratio leads to lower concentration of nitrogen in the finished compost
- (D) An initial C/N ratio of 30 to 50 is optimal for composting

[Please Turn Over]

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

Assertion (A) : Hardness plays an important role in metal toxicity in water body.

Reason (R) : Toxicity of Copper (Cu) and Zinc (Zn) in freshwater becomes lower due to higher concentration of Ca^{2+} .

Choose the correct answer:

Codes:

- (A) Both (A) and (R) are correct and (R) is the correct explanation of (A).
- (B) Both (A) and (R) are correct and (R) is not the correct explanation of (A).
- (C) (A) is correct but (R) is incorrect.
- (D) (A) is incorrect but (R) is correct.

9. The Noctilucent Clouds (NLC) is found in

- (A) Stratosphere
- (B) Mesosphere
- (C) Thermosphere
- (D) Ionosphere

10. Minimum concentration of chlorophyll-a in any aquatic system during eutrophication is

- (A) 5 $\mu\text{g/L}$
- (B) 10 $\mu\text{g/L}$
- (C) 20 $\mu\text{g/L}$
- (D) 30 $\mu\text{g/L}$

11. In which method of Environmental Impact Assessment 'Sieve mapping' is essential?

- (A) Leopold matrix method
- (B) Overlay method
- (C) Checklist method
- (D) Sorenson network method

12. Which of the following can be used for valuing environmental amenities?

- (i) Hedonic Pricing
- (ii) Travel Cost
- (iii) Contingent Valuation

Choose the correct one from the following:

- (A) (i) only
- (B) (ii) only
- (C) (i), (ii) and (iii)
- (D) (ii) and (iv) only

13. Match the following and select the correct answer from the codes given below:

List-I

List-II

- | | |
|-----------------|---|
| (i) ISO 14020 | (a) Environmental auditing |
| (ii) ISO 14010 | (b) Quantifying and reporting green house gas (GHG) emissions |
| (iii) ISO 14040 | (c) Environmental labelling |
| (iv) ISO 14064 | (d) Lifecycle assessment |

Codes:

- | | | | | |
|-----|-----|------|-------|------|
| (A) | i-c | ii-a | iii-d | iv-b |
| (B) | i-c | ii-a | iii-b | iv-d |
| (C) | i-a | ii-d | iii-b | iv-c |
| (D) | i-a | ii-b | iii-c | iv-d |

14. The Article 48 (A) and 51A (G) were incorporated after the amendment of the Indian Constitution for the _____ time.

- (A) 40th
- (B) 41st
- (C) 42nd
- (D) 43rd

15. Brundtland Commission Report is known as

- (A) Population explosion
- (B) The silent spring
- (C) Diversity of life
- (D) Our common future

16. In an ecosystem with limited food supply, the growth of a single species will be best explained by

- (A) Exponential growth model
- (B) Logistic model
- (C) Streeter-Phelps model
- (D) Lotka-Volterra model

17. Characteristics of successful invasive plant species are

- (i) Rapid growth and early flowering
- (ii) High phenotypic plasticity
- (iii) Production of large number of seeds

Choose the correct answer:

- (A) (i) only
- (B) (i) and (ii) only
- (C) (ii) and (iii) only
- (D) (i), (ii) and (iii)

18. High BOD of water reveals the quality of water to be

- (A) Good for drinking
- (B) Highly polluted
- (C) Highly contaminated with metals
- (D) Contaminated with algae

19. Conversion of organic waste into manure is known as

- (A) Fermentation
- (B) Vermicompost
- (C) Fertiliser
- (D) Degradation

20. Asiatic lion is conserved in one of the following National Park.

- (A) Bandhavgarh
- (B) Gir
- (C) Bandipur
- (D) Dachigam

21. Consider the following statements:

- (i) Urban sprawl implies growing horizontally rather than vertically.
- (ii) Urban sprawl implies planned development.

Choose the correct answer:

- (A) (i) is false and (ii) is true.
- (B) Both (i) and (ii) are true.
- (C) (i) is true and (ii) is false.
- (D) Both (i) and (ii) are false.

22. Which is *not* the correct method for disposal of low-level radioactive wastes?

- (A) Waste has been buried and monitored in near-surface.
- (B) The place where the hydrological and geological conditions can limit the migration of radioactivity.
- (C) Temporary storing in pools of water
- (D) Reprocessing to recover unfissioned materials

23. The widely used aerobic suspension type waste treatment system is

- (A) Trickling filter
- (B) Rotating biological contactor
- (C) Activated sludge process
- (D) Percolating filter

24. The predominant gas generated from a Municipal Solid Waste (MSW) landfill site is

- (A) CO₂
- (B) CO
- (C) CH₄
- (D) SO₂

25. What is the process flow in an integrated solid waste management system?

- (A) Generation — Source separation — Facility separation — Collection — Transfer and transport — Landfill
- (B) Generation — Source separation — Collection — Transfer and transport — Facility separation — Landfill
- (C) Generation — Source separation — Collection — Facility separation — Transfer and transport — Landfill
- (D) Generation — Source separation — Collection — Landfill — Facility separation — Transfer and transport

26. A graphical representation where frequencies are plotted against class intervals is called

- (A) Stem and Leaf plot
- (B) Pie chart
- (C) Histogram
- (D) Box plot

27. Which plant has been used in phytoremediation for uptake of cadmium from contaminated soil?

- (A) *Helianthes annuus*
- (B) *Brassica juncea*
- (C) *Silene vulgaris*
- (D) *Oscimum basilicum*

28. Match the following and select the correct answer from the codes given below:

List-I

List-II

(Causative organism)

(Disease)

- | | |
|---------------------------------|-----------------------------------|
| (a) <i>Salmonella paratyphi</i> | (i) Paratyphoid |
| (b) <i>Naegteria fowleri</i> | (ii) Typhoid |
| (c) <i>Salmonella typhi</i> | (iii) Amoebic meningoencephalitis |
| (d) <i>Shigella flexnery</i> | (iv) Bacillary dysentery |

Codes:

- | | | | |
|-----------|-------|-------|------|
| (a) | (b) | (c) | (d) |
| (A) (iii) | (ii) | (iv) | (i) |
| (B) (ii) | (iii) | (i) | (iv) |
| (C) (i) | (iii) | (ii) | (iv) |
| (D) (i) | (ii) | (iii) | (iv) |

29. Following is the population interaction that occur both in parasitism and predation:

- (A) + O
- (B) --
- (C) - O
- (D) + -

30. In logistic growth model the maximum sustainable yield is obtained when

- (A) $N = K/2$
- (B) $N = K$
- (C) $N = 2K$
- (D) $N = 2/3K$

31. Which state in India has the highest forest cover?

- (A) Madhya Pradesh
- (B) Arunachal Pradesh
- (C) Mizoram
- (D) West Bengal

32. The UNEP initiated the 17 Sustainable Development Goals in 2015. Which one of the following is the 13th Sustainable Development Goal?

- (A) Life below water
- (B) Affordable and clean energy
- (C) Life on land
- (D) Climate action

33. Which of the following is a major threat to biodiversity?

- (A) Habitat destruction
- (B) Pollution
- (C) Increase in Wildlife trade
- (D) All of the above

34. Project Tiger was launched by the Government of India in

- (A) 1972
- (B) 1973
- (C) 1974
- (D) 1975

35. The number of current Biodiversity Hotspots in India are

- (A) 2
- (B) 3
- (C) 4
- (D) 5

36. Tundra is a biome characterized by

- (A) Stunted trees and permanently frozen sub-surface soil
- (B) Coniferous trees and permanently frozen sub-surface soil
- (C) Lack of trees and permanently frozen sub-surface soil
- (D) Evergreen trees and permanently frozen sub-surface soil

37. Match the following in terms of their IUCN status and select the correct answer from the codes given below:

List-I

List-II

- | | |
|----------------------|---------------------------|
| (i) Tasmanian tiger | (a) Critically endangered |
| (ii) Clouded leopard | (b) Endangered |
| (iii) Black rhino | (c) Vulnerable |
| (iv) Blue whale | (d) Extinct |

Codes:

- (A) i-d ii-c iii-a iv-b
- (B) i-c ii-a iii-b iv-d
- (C) i-a ii-b iii-d iv-c
- (D) i-a ii-b iii-c iv-d

38. Which one of the following is correct?

- (A) World Water Day — 20th March
- (B) Ozone Day — 16th October
- (C) Earth Day — 22nd May
- (D) World Wetland Day — 2nd February

39. The sum of the internal energy and product of pressure and volume is known as

- (A) Enthalpy
- (B) Gibbs free energy
- (C) Entropy
- (D) Helmholtz free energy

40. The movement of energy from primary producers to consumers is effected by

- (A) The process of eating
- (B) The rate of rainfall
- (C) The rate of evaporation
- (D) The rate of transpiration

41. Which one is *not* the appropriate condition of metapopulation?

- (A) Suitable habitat for local breed population
- (B) A substantial risk of extinction
- (C) Isolation to prevent recolonization after local extinction
- (D) Dynamics of the local population are not synchronized

42. The term 'Eutrophication' means

- (A) Enrichment of water by nutrients
- (B) Enrichment of air by nutrients
- (C) Enrichment of soil by nutrients
- (D) All of the above

[Please Turn Over]

43. The Montreal Protocol (1987) was held in connection for reducing

- (A) The production of CO₂ in the atmosphere
- (B) The production and import of ozone depleting substances thereby protecting the ozone layer
- (C) The production of agriculture to protect the environment
- (D) The production of GHG

44. Which of the following area is famous for Olive Ridley Turtles?

- (A) Sunderban
- (B) Rann of Kutch
- (C) Bhitarkanika
- (D) Kerala coast

45. Which is the largest soil group of India?

- (A) Black soil
- (B) Alluvial soil
- (C) Red soil
- (D) Mountain soil

46. The Headquarter of Environment Planning Organization NEERI, is located at

- (A) Kanpur
- (B) Chennai
- (C) Nagpur
- (D) Mumbai

47. The theme of World Environment Day in 2021 was

- (A) Seven Billion Dreams, One Planet Consume with Care
- (B) Ecosystem Restoration
- (C) Celebrate Biodiversity
- (D) Beat Plastic Pollution

48. Agenda 21 is the outcome of

- (A) Stockholm Conference
- (B) Basel Convention
- (C) Ramsar Convention
- (D) Rio Summit

49. When the temperature of the atmosphere falls at a rate greater than the dry adiabatic lapse rate, the atmosphere is

- (A) Stable
- (B) Highly stable
- (C) Unstable
- (D) Neutral condition

50. Which state has the largest coastline in India?

- (A) West Bengal
- (B) Karnataka
- (C) Gujarat
- (D) Odisha

51. Wind rose represents statistical distribution of

- (A) Wind velocity in vector form
- (B) Wind speeds in scalar form
- (C) Wind speeds in π diagram
- (D) Wind speeds in the form of histograms

52. Fukushima Daiichi Nuclear Disaster (2011) was caused due to

- (A) Earthquake followed by *Tsunami*
- (B) Earthquake
- (C) Release of radioactive materials
- (D) Release of hydrogen gas

53. 'Polymer Fume Fever' is associated with
(A) Use of aluminium coated utensils
(B) Use of iron coated utensils
(C) Use of teflon coated utensils
(D) Use of zinc coated utensils
54. On a topographic map, lines that connect points of the same elevation are termed as
(A) Benchmarks
(B) Bathymetric lines
(C) Contour lines
(D) Isobars
55. The internal structure of crystal was first studied with which of the following?
(A) X-rays
(B) Isotopes
(C) Electron microscopes
(D) LASER
56. Which pollutant is observed in groundwater in some parts of Birbhum district?
(A) Fluoride
(B) Arsenic
(C) Mercury
(D) Cadmium
57. Molten rock beneath the Earth's crust is known as
(A) Lava
(B) Liquicite
(C) Igneous
(D) Magma
58. Galena is a primary ore of which of the following metals?
(A) Lead
(B) Zinc
(C) Copper
(D) Gold
59. Field capacity represents the maximum quantity of water held
(A) In the groundwater zone
(B) In the soil against the force of gravity
(C) Below the water table
(D) In the intermediate zone
60. Which of the following minerals does *not* contain silica tetrahedrons in its structure?
(A) Halite
(B) Quartz
(C) Muscovite
(D) Orthoclase
61. Which of the following is an igneous rock?
(A) Shale
(B) Coal
(C) Granite
(D) Slate
62. The geomorphological landforms created by subglacial meltwater is known as
(A) Mudflow
(B) Lahars
(C) Eskers
(D) Cirques

63. The solidified lava of a volcano belongs to which type of rock family?

- (A) Metamorphic
- (B) Igneous
- (C) Sedimentary
- (D) Fossilized

64. The rock, which is most resistant to both chemical and mechanical weathering is

- (A) Limestone
- (B) Quartzite
- (C) Marble
- (D) Shale

65. What will be the value of Therapeutic Index (TI) if ED_{50} value is 20 and LD_{50} value is 200?

- (A) 4000
- (B) 0.1
- (C) 1000
- (D) 10

66. The effects of plastic pollution on human beings is called 'The blood-plastic clotting problem' that can be circumvented by the chemicals

- (A) Graphite, Benzalkonium, Heparin
- (B) Zinc chloride, Zinc sulphate, Sodium pyridine thione
- (C) Magnesium citrate, Magnesium carbonate
- (D) Ferric dimethyldithiocarbamate, Ferrous sulphate, Dimercaprol, Deferoxamine

67. Read the following two statements—*Assertion (A)* and *(R)* for *Reason* and find the correct answer using codes below:

Assertion (A) : Soil acidification is a major factor in water acidification.

Reason (R) : The acids in the soil dissociate into their respective ions and transported into surface water.

Codes:

- (A) Both (A) and (R) are correct and (R) is the correct explanation of (A).
- (B) Both (A) and (R) are correct and (R) is not the correct explanation of (A).
- (C) (A) is incorrect but (R) is correct.
- (D) (A) is correct but (R) is incorrect.

68. The chemical composition of earth's crust in descending order of percentage weight is

- (A) $Si > Al > Fe > Ca$
- (B) $Al > Fe > Ca > Si$
- (C) $Fe > Ca > Si > Al$
- (D) $Ca > Si > Al > Fe$

69. Which of the following pollutants are under the category of 'Criteria' air pollutants?

- (A) HCN, CO, SO_2 , NO_2 , NH_3 , HCl
- (B) N_2O , CH_4 , CO, SO_2 , NO_2
- (C) O_3 , PM_{10} , $PM_{2.5}$, SO_2 , CH_4 , CO_2
- (D) CO, Pb, Ground level O_3 , PM, NO_2 , SO_2

70. Following is the unit to measure the thickness of ozone layer:

- (A) ppm
- (B) Decibel
- (C) Dobson unit
- (D) Cubic meter

71. O₃ in ozone layer is formed by action of

- (A) IR radiation
- (B) Blue radiation
- (C) UV radiation
- (D) Other radiations

72. Thermal pollution is more prevalent near

- (A) Hot water spring
- (B) Coal based power plants
- (C) Tropical zones
- (D) Temperate zones

73. Choose the correct combination from the following:

List I

List II

- | | |
|---|----------|
| (a) The Air (Prevention and Control of Pollution) Act | (1) 2002 |
| (b) The Environment (Protection) Act | (2) 1974 |
| (c) The Water (Prevention and Control of Pollution) Act | (3) 1981 |
| (d) Biodiversity Act | (4) 1986 |

- (A) (a) – (3), (b) – (4), (c) – (1), (d) – (2)
- (B) (a) – (1), (b) – (2), (c) – (4), (d) – (3)
- (C) (a) – (3), (b) – (4), (c) – (2), (d) – (1)
- (D) (a) – (2), (b) – (4), (c) – (1), (d) – (3)

74. One ppm is

- (A) 1 kg/ton
- (B) 1 µg/g
- (C) 1 ng/ml
- (D) 1 mg/ml

75. Orthoclase is what number in Moh's hardness scale?

- (A) 4
- (B) 5
- (C) 6
- (D) 7

76. What are the effects of 'Nuclear fallout'?

- (A) Deformities in cleft plate
- (B) Down's syndrome
- (C) Increased psychological health disorders
- (D) All of the above

77. Which country is running on almost 100% renewable energy?

- (A) Costa Rica
- (B) Iceland
- (C) Norway
- (D) Austria

78. India plans to produce _____ GW of renewable energy by the year 2022.

- (A) 175
- (B) 160
- (C) 200
- (D) 250

79. To check the transparency of water one of the following instruments is used:

- (A) Secchi Disc
- (B) Ekman Dredger
- (C) Spectrophotometer
- (D) pH meter

80. Tick the correct answer from the list below which is *not* an organochlorine compound:

- (A) Aldrin
- (B) Chlordane
- (C) Aldicarb
- (D) Endosulfan

81. In acid rain the pH of water is below _____.

- (A) 6.0
- (B) 5.9
- (C) 5.6
- (D) 5.7

82. The 'Minamata Disease' is caused due to _____ poisoning.

- (A) Floride
- (B) Cadmium
- (C) Mercury
- (D) Lead

83. Indicator plants which might be utilized to give an indication for atmospheric pollution by SO₂ are

- (A) Mosses
- (B) Climbers
- (C) Gymnosperms
- (D) Lichens

84. 'Incineration' is a process by which one can manage the problem of

- (A) Liquid waste
- (B) Forest fire
- (C) Solid waste
- (D) Air pollutant

85. Which of the following is known as secondary pollutant?

- (A) PAN
- (B) CO
- (C) CO₂
- (D) Aerosol

86. Which of the following analytical methods will be used to identify inorganic ions and organic compounds in the environmental samples?

- (A) Galvanomerty
- (B) Colorimetry
- (C) Titrimetry
- (D) XRD

87. The mineral halite is chemically known as

- (A) Potassium chloride
- (B) Sodium chloride
- (C) Calcium chloride
- (D) Magnesium chloride

88. Match the following and select the correct answer from the codes given below:

<i>List-I</i> (Events)	<i>List-II</i> (Year)
(a) Montreal Protocol	(i) 1992
(b) Earth Summit, Rio-de-Jeneiro	(ii) 1987
(c) Kyoto Protocol	(iii) 1972
(d) Stockholm Conference	(iv) 1997

Codes:

- | | | | | |
|-----|-------|-------|-------|-------|
| | (a) | (b) | (c) | (d) |
| (A) | (i) | (iii) | (iv) | (ii) |
| (B) | (ii) | (i) | (iii) | (iv) |
| (C) | (ii) | (i) | (iv) | (iii) |
| (D) | (iii) | (ii) | (i) | (iv) |

89. Match the following and select the correct answer from the codes given below:

List-I

(Biomedical wastes)

List-II

(Treatment/Disposal method)

- | | |
|-------------------------|---------------------------|
| (a) Human tissues | (i) Autoclaving |
| (b) Scalpels | (ii) Secured landfills |
| (c) Solid plaster casts | (iii) Incineration |
| (d) Discarded medicines | (iv) Microwave mutilation |

Codes:

- | | | | |
|-----------|-------|------|------|
| (a) | (b) | (c) | (d) |
| (A) (i) | (iii) | (iv) | (ii) |
| (B) (iii) | (i) | (iv) | (ii) |
| (C) (ii) | (iii) | (iv) | (i) |
| (D) (iv) | (iii) | (ii) | (i) |

90. A buffer solution contains 0.10 mole of CH_3COOH and 0.10 mole CH_3COO^- per litre.

The pH of the buffer is

(Given: $K_A = 1.8 \times 10^{-5}$

$\log 1.8 = 0.26$)

- (A) pH = 4.74
 (B) pH = 4.04
 (C) pH = 4.94
 (D) pH = 4.54

91. Which of the following species in the atmosphere is called atmospheric detergent?

- (A) Chlorine radical
 (B) Hydroxyl radical
 (C) Methyl radical
 (D) Ozone radical

92. Which of the following is a secondary aerosol?

- (A) Pollen
 (B) Virus
 (C) Sodium chloride
 (D) Ammonium sulfate

93. BOD of the effluents discharged on land for irrigation should not exceed

- (A) 30 mg/L
 (B) 100 mg/L
 (C) 300 mg/L
 (D) 60 mg/L

94. What are LEED standards used for?

- (A) They dictate the amount of emissions certain manufacturing building can emit
 (B) They guide the design and certification for the construction of sustainable buildings
 (C) They are used to certify industries as environment friendly
 (D) They dictate whether a forest is being cut in a sustainable manner or not

95. The noise index L_{eq} for a specific duration is a measure of

- (A) Acoustic energy content
 (B) Average noise amplitude
 (C) Sum of instantaneous sound pressure levels
 (D) Fluctuations in noise levels

96. According to Darcy's law for groundwater movement, velocity is proportional to

- (A) Hydraulic gradient
 (B) Square of hydraulic gradient
 (C) Square root of hydraulic gradient
 (D) Reciprocal of hydraulic gradient

[Please Turn Over]

97. An isolated system is one in which

- (A) Mass does not cross boundaries of the system, though energy may do so
- (B) Neither mass nor energy crosses the boundaries of the system
- (C) Both energy and mass cross the boundaries of the system
- (D) Mass crosses the boundary but not the energy

98. Match the following and select the right answer from the codes given below:

- | | |
|-------------------------------|----------------------|
| (i) Black foot disease | (a) Cadmium toxicity |
| (ii) <i>Itai-itai</i> disease | (b) Mercury toxicity |
| (iii) Minamata disease | (c) Copper toxicity |
| (iv) Wilson disease | (d) Arsenic toxicity |

Codes:

- | | | | | |
|-----|-------|-------|-------|------|
| | (a) | (b) | (c) | (d) |
| (A) | (i) | (ii) | (iii) | (iv) |
| (B) | (iii) | (iv) | (i) | (ii) |
| (C) | (iii) | (i) | (iv) | (ii) |
| (D) | (ii) | (iii) | (iv) | (i) |

99. Consider an OTEC system operating between 30°C and 5°C . What would be the maximum possible efficiency ($\eta_{\max}$) for an electric generating station operating with these temperatures?

Select the correct answer.

- (A) $\eta_{\max} = 10.25\%$
- (B) $\eta_{\max} = 12\%$
- (C) $\eta_{\max} = 14\%$
- (D) $\eta_{\max} = 8.25\%$

100. Rainfall on a map is shown by

- (A) Isobar
- (B) Isotherm
- (C) Isohytes
- (D) Isochore

Space for Rough Work

