

Roll No.

Question Booklet Number

O. M. R. Serial No.

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M. Sc. (Second Semester)
(NEP) EXAMINATION, 2025-26

CHEMISTRY

(Elementary Environmental Chemistry)

Paper Code							
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Questions Booklet
Series

A

Time : 1:30 Hours]

[Maximum Marks : 75

Instructions to the Examinee :

1. Do not open the booklet unless you are asked to do so.
2. The booklet contains 100 questions. Examinee is required to answer 75 questions in the OMR Answer-Sheet provided and not in the question booklet. All questions carry equal marks.
3. Examine the Booklet and the OMR Answer-Sheet very carefully before you proceed. Faulty question booklet due to missing or duplicate pages/questions or having any other discrepancy should be got immediately replaced.

परीक्षार्थियों के लिए निर्देश :

1. प्रश्न-पुस्तिका को तब तक न खोलें जब तक आपसे कहा न जाए।
2. प्रश्न-पुस्तिका में 100 प्रश्न हैं। परीक्षार्थी को 75 प्रश्नों को केवल दी गई OMR आन्सर-शीट पर ही हल करना है, प्रश्न-पुस्तिका पर नहीं। सभी प्रश्नों के अंक समान हैं।
3. प्रश्नों के उत्तर अंकित करने से पूर्व प्रश्न-पुस्तिका तथा OMR आन्सर-शीट को सावधानीपूर्वक देख लें। दोषपूर्ण प्रश्न-पुस्तिका जिसमें कुछ भाग छपने से छूट गए हों या प्रश्न एक से अधिक बार छप गए हों या उसमें किसी अन्य प्रकार की कमी हो, तो उसे तुरन्त बदल लें।

(Remaining instructions on the last page)

(शेष निर्देश अन्तिम पृष्ठ पर)

(Only for Rough Work)

1. Which of the following is not a greenhouse gas ?
 - (A) CO_2
 - (B) CH_4
 - (C) Chlorofluorocarbons
 - (D) O_2
2. BOD is :
 - (A) Waste decomposed in 5 days
 - (B) Oxygen used in 5 days
 - (C) Microorganisms killed in 5 days
 - (D) Dissolved oxygen left after 5 days
3. Which detergents are used in hair conditioners ?
 - (A) Anionic
 - (B) Cationic
 - (C) Non-ionic
 - (D) Synthetic
4. SO_2 causes :
 - (A) Respiratory and lung disease
 - (B) Acid rain
 - (C) Corrosion of building material
 - (D) All of the above
5. Which of the following is present in maximum amount in acid rain ?
 - (A) HNO_3
 - (B) H_2SO_4
 - (C) HCl
 - (D) H_2CO_3
6. Aerosols present in air are :
 - (A) Negatively charged
 - (B) Positively charged
 - (C) Neutral
 - (D) Combination of all of the above
7. Which of the following is not involved in the formation of photochemical smog ?
 - (A) NO
 - (B) O_3
 - (C) C_xH_y
 - (D) SO_2
8. Which of the following has greatest affinity for hemoglobin ?
 - (A) CO
 - (B) NO
 - (C) O_2
 - (D) CO_2

9. Pollutants released from iron and steel industry are :
- (A) CO_2 , NO_2 , H_2S
 - (B) CO , CO_2 , SO_2
 - (C) CO_2 , SO_3 , NO_2
 - (D) CO_2 , NO and SO_3
10. Which of the following is the coldest réxampleion ?
- (A) Troposphere
 - (B) Mesosphere
 - (C) Stratosphere
 - (D) Thermosphere
11. Which of the following does not cause water pollution ?
- (A) Heavy metals such as Hg, Pb, Cd
 - (B) Detergents
 - (C) Chemical effluents
 - (D) Freons.
12. What is most harmful for life on globe ?
- (A) Deforestation
 - (B) Soil erosion
 - (C) Increasing desert
 - (D) Nuclear fallout
13. White lung cancer is caused by :
- (A) Paper
 - (B) Textiles
 - (C) Silica
 - (D) Asbestos
14. Fluorosis, the base disease is caused by the presence of :
- (A) Pesticides in water
 - (B) Fluoridesis in water
 - (C) CO in air
 - (D) SO_2 in air
15. Which of the following pollutants is not emitted during volcanic eruptions ?
- (A) SO_2
 - (B) H_2S
 - (C) Hydrocarbons
 - (D) CO sol
16. Which of the following is the uppermost réxampleion of the atmosphere ?
- (A) Stratosphere
 - (B) Troposphere
 - (C) Exosphere
 - (D) Ionosphere

17. The size of particulates of H_2SO_4 fog lies in the range :
- (A) 5 - 100 nm
 - (B) 100 - 500 nm
 - (C) 500 - 1000 nm
 - (D) 1000 - 10,000 nm
18. Which of the following statements is false ?
- (A) London smog is oxidising in nature
 - (B) London smog contains H_2SO_4 droplets
 - (C) London smog is formed in winter
 - (D) London smog causes bronchitis
19. Aerobic oxidation is caused by :
- (A) Aerobic bacteria in presence of excess of oxygen
 - (B) Aerobic bacteria in absence of oxygen
 - (C) Anaerobic bacteria in presence of oxygen
 - (D) Anaerobic bacteria in absence of oxygen.
20. Which of the following is not a greenhouse gas ?
- (A) CO_2
 - (B) CH_4
 - (C) chlorofluorocarbons
 - (D) O_2
21. Choose the wrong statement/s :
- (A) CO_2 is responsible for greenhouse effect
 - (B) CO_2 can absorb infrared radiation but does not allow them to pass through
 - (C) NO is less harmful than NO_2
 - (D) Acid rain contains mainly HNO_3
22. Lake containing excess of nutritious substances are called :
- (A) Polluted Lakes
 - (B) Eutrophic Lakes
 - (C) Dead Lake
 - (D) Green Lake
23. Ozone in the stratosphere is deleted by :
- (A) CF_2Cl_2
 - (B) C_7F_{16}
 - (C) $\text{C}_6\text{H}_6\text{Cl}_6$
 - (D) C_6H_6

24. Which of the following is responsible for eutrophication of lakes ?
- (A) Cl^-
 - (B) Ca^{2+}
 - (C) ClO_4^-
 - (D) PO_4^{-3}
25. The smog is essentially caused by the presence of :
- (A) O_2 and O_3
 - (B) O_2 and N_2
 - (C) Oxidise of sulphur and nitrogen
 - (D) O_3 and N_2
26. Ultraviolet radiation is absorbed by :
- (A) Exosphere
 - (B) Ionosphere
 - (C) Ozonosphere
 - (D) Stratosphere
27. Environmental pollution affects :
- (A) Biotic components
 - (B) Human beings only
 - (C) Plants only
 - (D) Biotic and abiotic components of environment
28. Which power is generated using water ?
- (A) Solar power
 - (B) Thermal power
 - (C) Biofuel
 - (D) Hydroelectric power
29. Hydrosphere includes :
- (A) Water on the surface of the planet
 - (B) Underground water
 - (C) Water in the air
 - (D) All of the above
30. How much percentage of the Earth is covered with water, approximately ?
- (A) 15%
 - (B) 20%
 - (C) 17%
 - (D) 71%
31. What is the primary function of soil ?
- (A) Water storage
 - (B) Plant growth support
 - (C) Waste decomposition
 - (D) All of the above

32. Which soil horizon is richest in organic matter ?
- (A) O horizon
 - (B) A horizon
 - (C) B horizon
 - (D) C horizon
33. What is soil erosion ?
- (A) Soil formation process
 - (B) Soil degradation process
 - (C) Soil conservation process
 - (D) Soil fertility process
34. Which type of soil is best for agriculture ?
- (A) Sandy soil
 - (B) Clayey soil
 - (C) Loamy soil
 - (D) Rocky soil
35. What is the pH range of acidic soil ?
- (A) 0-5.5
 - (B) 5.5-7
 - (C) 7-9
 - (D) 9-14
36. Which nutrient is essential for plant growth ?
- (A) Nitrogen
 - (B) Phosphorus
 - (C) Potassium
 - (D) All of the above
37. What is soil salinization ?
- (A) Increase in soil fertility
 - (B) Decrease in soil pH
 - (C) Increase in soil salt content
 - (D) Decrease in soil water content
38. Which process involves micro-organisms breaking down organic matter ?
- (A) Decomposition
 - (B) Photosynthesis
 - (C) Respiration
 - (D) Transpiration
39. What is the main cause of soil pollution ?
- (A) Industrial activities
 - (B) Agricultural activities
 - (C) Domestic waste
 - (D) All of the above
40. Which soil conservation method involves planting trees ?
- (A) Afforestation
 - (B) Reforestation
 - (C) Agroforestry
 - (D) All of the above

41. What is the study of soil called ?
(A) Pedology
(B) Geology
(C) Ecology
(D) Biology
42. Which soil component is essential for plant growth ?
(A) Mineral matter
(B) Organic matter
(C) Water
(D) All of the above
43. What is the process of soil formation called ?
(A) Weathering
(B) Erosion
(C) Deposition
(D) Pedogenesis
44. Which type of soil is prone to water logging ?
(A) Sandy soil
(B) Clayey soil
(C) Loamy soil
(D) Silt soil
45. What is the term for soil's ability to hold water ?
(A) Porosity
(B) Permeability
(C) Water-holding capacity
(D) Infiltration
46. Which nutrient deficiency causes yellowing of leaves ?
(A) Nitrogen
(B) Phosphorus
(C) Potassium
(D) Calcium
47. What is the main cause of soil erosion ?
(A) Wind
(B) Water
(C) Human activities
(D) All of the above
48. Which soil conservation method involves contour farming ?
(A) Terracing
(B) Crop rotation
(C) Contour farming
(D) Mulching
49. What is the pH range of neutral soil ?
(A) 0-5.5
(B) 5.5-7
(C) 7-9
(D) 9-14
50. Which microorganism is important for nitrogen fixation ?
(A) Bacteria
(B) Fungi
(C) Algae
(D) Protozoa

51. Who is known as the Father of Environmental Science ?
- (A) Dr. Salim Ali
 - (B) Dr. B.R. Ambedkar
 - (C) Dr. S. Ramachandran
 - (D) None of the above
52. Who wrote “Silent Spring”, a key environmental science book ?
- (A) Rachel Carson
 - (B) Dr. Salim Ali
 - (C) Dr. Vandana Shiva
 - (D) Dr. Anil Agarwal
53. The “Father of Environmental Science” is often associated with :
- (A) Conservation efforts
 - (B) Pollution control
 - (C) Sustainable development
 - (D) All of the above
54. Dr. Salim Ali’s work focused on :
- (A) Ornithology
 - (B) Botany
 - (C) Zoology
 - (D) Ecology
55. Rachel Carson’s work led to the banning of :
- (A) DDT
 - (B) CFCs
 - (C) Lead paint
 - (D) Plastics
56. Who is a prominent Indian environmentalist ?
- (A) Dr. Salim Ali
 - (B) Dr. Vandana Shiva
 - (C) Dr. Anil Agarwal
 - (D) All of the above
57. Father of Environmental Science emphasized :
- (A) Conservation
 - (B) Exploitation
 - (C) Development
 - (D) Urbanization
58. “Silent Spring” was published in :
- (A) 1952
 - (B) 1962
 - (C) 1972
 - (D) 1982
59. Dr. Salim Ali’s work was primarily in :
- (A) India
 - (B) USA
 - (C) Africa
 - (D) Europe

60. The term “Father of Environmental Science” is often used for :
- (A) A specific person globally
 - (B) Different people in different contexts
 - (C) Only Indian environmentalists
 - (D) None of the above
61. The atmosphere is composed of :
- (A) 78% N₂, 21% O₂, 1% other gases
 - (B) 50% N₂, 30% O₂, 20% other gases
 - (C) 21% N₂, 78% O₂, 1% other gases
 - (D) 90% N₂, 5% O₂, 5% other gases
62. The atmosphere’s primary function is to :
- (A) Regulate temperature
 - (B) Provide oxygen
 - (C) Protect from radiation
 - (D) All of the above
63. The troposphere extends up to :
- (A) 10 km
 - (B) 20 km
 - (C) 50 km
 - (D) 100 km
64. The stratosphere contains :
- (A) Ozone layer
 - (B) Water vapor
 - (C) Dust particles
 - (D) All of the above
65. Ozone layer protects us from :
- (A) UV radiation
 - (B) Infrared radiation
 - (C) Gamma radiation
 - (D) X-rays
66. Greenhouse gases include :
- (A) CO₂, CH₄, N₂O
 - (B) O₂, N₂, Ar
 - (C) H₂O, O₃, CO
 - (D) None of the above
67. Global warming is caused by :
- (A) Increase in CO₂
 - (B) Decrease in O₂
 - (C) Increase in O₃
 - (D) Decrease in N₂
68. Acid rain is caused by :
- (A) SO₂, NO_x emissions
 - (B) CO₂, CH₄ emissions
 - (C) O₃, H₂O emissions
 - (D) None of the above
69. The atmosphere’s temperature decreases with altitude in :
- (A) Troposphere
 - (B) Stratosphere
 - (C) Mesosphere
 - (D) Thermosphere

70. The Karman line marks the boundary between :
- (A) Troposphere and stratosphere
 - (B) Stratosphere and mesosphere
 - (C) Atmosphere and space
 - (D) None of the above
71. Weather occurs in :
- (A) Troposphere
 - (B) Stratosphere
 - (C) Mesosphere
 - (D) Thermosphere
72. The atmosphere is divided into :
- (A) 3 layers
 - (B) 4 layers
 - (C) 5 layers
 - (D) 6 layers
73. Ozone depletion is caused by :
- (A) CFCs
 - (B) CO₂
 - (C) CH₄
 - (D) N₂O
74. Air pollution is caused by :
- (A) Industrial emissions
 - (B) Vehicle emissions
 - (C) Agricultural activities
 - (D) All of the above
75. The greenhouse effect is :
- (A) Natural process
 - (B) Human-induced process
 - (C) Both (A) and (B)
 - (D) None of the above
76. The atmosphere's pressure decreases with :
- (A) Altitude
 - (B) Temperature
 - (C) Humidity
 - (D) None of the above
77. The stratosphere is :
- (A) Isothermal
 - (B) Temperature increases with altitude
 - (C) Temperature decreases with altitude
 - (D) None of the above
78. The mesosphere is :
- (A) Warmest layer
 - (B) Coldest layer
 - (C) Middle layer
 - (D) None of the above

79. The thermosphere is :
- (A) Outermost layer
 - (B) Innermost layer
 - (C) Middle layer
 - (D) None of the above
80. Atmospheric circulation is driven by :
- (A) Solar radiation
 - (B) Earth's rotation
 - (C) Temperature differences
 - (D) All of the above
81. What is the main cause of industrial pollution ?
- (A) Agricultural activities
 - (B) Industrial waste discharge
 - (C) Vehicle emissions
 - (D) Domestic waste
82. Which industry is a major contributor to air pollution ?
- (A) Textile industry
 - (B) Food processing industry
 - (C) Cement industry
 - (D) All of the above
83. What is the primary pollutant released by thermal power plants ?
- (A) SO₂
 - (B) NO_x
 - (C) CO₂
 - (D) Particulate matter
84. Industrial pollution can cause :
- (A) Acid rain
 - (B) Global warming
 - (C) Water pollution
 - (D) All of the above
85. Which of the following is a hazardous industrial waste ?
- (A) Fly ash
 - (B) Sludge
 - (C) Heavy metals
 - (D) All of the above
86. What is the Bhopal gas tragedy related to ?
- (A) Chemical plant leak
 - (B) Nuclear power plant accident
 - (C) Oil refinery fire
 - (D) None of the above

87. Industrial pollution can be controlled by :
- (A) Implementing cleaner technologies
 - (B) Increasing production
 - (C) Discharging waste into water bodies
 - (D) None of the above
88. Which of the following industries is a major water polluter ?
- (A) Textile industry
 - (B) Paper industry
 - (C) Chemical industry
 - (D) All of the above
89. What is the main environmental impact of industrial pollution ?
- (A) Loss of biodiversity
 - (B) Climate change
 - (C) Health problems
 - (D) All of the above
90. The 'Polluter Pays Principle' is based on :
- (A) Precautionary principle
 - (B) Sustainable development
 - (C) Environmental liability
 - (D) None of the above
91. What is environmental toxicology ?
- (A) Study of toxic substances in the environment
 - (B) Study of environmental impact on humans
 - (C) Study of wildlife conservation
 - (D) None of the above
92. Which of the following is an environmental toxin ?
- (A) Lead
 - (B) Mercury
 - (C) Pesticides
 - (D) All of the above
93. Bioaccumulation refers to :
- (A) Accumulation of toxins in the environment
 - (B) Accumulation of toxins in organisms
 - (C) Breakdown of toxins in the environment
 - (D) None of the above

94. Which toxin is associated with Minamata disease ?
- (A) Lead
 - (B) Mercury
 - (C) Arsenic
 - (D) Cadmium
95. What is biomagnification ?
- (A) Increase in toxin concentration up the food chain
 - (B) Decrease in toxin concentration up the food chain
 - (C) Breakdown of toxins in the environment
 - (D) None of the above
96. Which of the following is a persistent organic pollutant (POP) ?
- (A) DDT
 - (B) PCBs
 - (C) Dioxins
 - (D) All of the above
97. Exposure to which toxin can cause neurological damage ?
- (A) Lead
 - (B) Mercury
 - (C) Arsenic
 - (D) All of the above
98. What is the LD₅₀ value ?
- (A) Lethal dose for 50% of test organisms
 - (B) Safe dose for humans
 - (C) Environmental concentration limit
 - (D) None of the above
99. Which of the following is a carcinogenic toxin ?
- (A) Asbestos
 - (B) Benzene
 - (C) Vinyl chloride
 - (D) All of the above
100. Environmental toxicology assesses :
- (A) Human health risks
 - (B) Ecological risks
 - (C) Both (A) and (B)
 - (D) None of the above

(Only for Rough Work)

4. Four alternative answers are mentioned for each question as—A, B, C & D in the booklet. The candidate has to choose the correct answer and mark the same in the OMR Answer-Sheet as per the direction :

Example :

Question :

- Q. 1 (A) ● (C) (D)
 Q. 2 (A) (B) ● (D)
 Q. 3 (A) ● (C) (D)

Illegible answers with cutting and over-writing or half filled circle will be cancelled.

5. Each question carries equal marks. Marks will be awarded according to the number of correct answers you have.
6. All answers are to be given on OMR Answer Sheet only. Answers given anywhere other than the place specified in the answer sheet will not be considered valid.
7. Before writing anything on the OMR Answer Sheet, all the instructions given in it should be read carefully.
8. After the completion of the examination candidates should leave the examination hall only after providing their OMR Answer Sheet to the invigilator. Candidate can carry their Question Booklet.
9. There will be no negative marking.
10. Rough work, if any, should be done on the blank pages provided for the purpose in the booklet.
11. To bring and use of log-book, calculator, pager and cellular phone in examination hall is prohibited.
12. In case of any difference found in English and Hindi version of the question, the English version of the question will be held authentic.

Impt. : On opening the question booklet, first check that all the pages of the question booklet are printed properly. If there is any discrepancy in the question Booklet, then after showing it to the invigilator, get another question Booklet of the same series.

4. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार सम्भावित उत्तर—A, B, C एवं D हैं। परीक्षार्थी को उन चारों विकल्पों में से सही उत्तर छँटना है। उत्तर को OMR आन्सर-शीट में सम्बन्धित प्रश्न संख्या में निम्न प्रकार भरना है :

उदाहरण :

प्रश्न :

- प्रश्न 1 (A) ● (C) (D)
 प्रश्न 2 (A) (B) ● (D)
 प्रश्न 3 (A) ● (C) (D)

अपठनीय उत्तर या ऐसे उत्तर जिन्हें काटा या बदला गया है, या गोले में आधा भरकर दिया गया, उन्हें निरस्त कर दिया जाएगा।

5. प्रत्येक प्रश्न के अंक समान हैं। आपके जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
6. सभी उत्तर केवल ओ. एम. आर. उत्तर-पत्रक (OMR Answer Sheet) पर ही दिये जाने हैं। उत्तर-पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।
7. ओ. एम. आर. उत्तर-पत्रक (OMR Answer Sheet) पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाये।
8. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी OMR Answer Sheet उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें। परीक्षार्थी अपने साथ प्रश्न-पुस्तिका ले जा सकते हैं।
9. निगेटिव मार्किंग नहीं है।
10. कोई भी रफ कार्य, प्रश्न-पुस्तिका के अन्त में, रफ-कार्य के लिए दिए खाली पेज पर ही किया जाना चाहिए।
11. परीक्षा-कक्ष में लॉग-बुक, कैलकुलेटर, पेजर तथा सेल्युलर फोन ले जाना तथा उसका उपयोग करना वर्जित है।
12. प्रश्न के हिन्दी एवं अंग्रेजी रूपान्तरण में भिन्नता होने की दशा में प्रश्न का अंग्रेजी रूपान्तरण ही मान्य होगा।

महत्वपूर्ण : प्रश्नपुस्तिका खोलने पर प्रथमतः जाँच कर देख लें कि प्रश्न-पुस्तिका के सभी पृष्ठ भलीभाँति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्षनिरीक्षक को दिखाकर उसी सिरीज की दूसरी प्रश्न-पुस्तिका प्राप्त कर लें।