Roll No. .....

Question Booklet Number

O. M. R. Serial No. | | | | | | | |

M. Sc. (Second Semester)

(NEP) EXAMINATION, 2025-26

CHEMISTRY

(Environmental Chemistry) (Elective)

Paper Code							
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Questions Booklet Series
C

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 acts as a sink of CO_2 ?

(A) Forests

(B) Oceans

(C) Soil

(D) All of the above

2. The most toxic species of mercury in water is :

(A) $Hg^{2}+$

(B) Hg_2^{2+}

(C) CH_3Hg^{+}

(D) None of the above

3. Biodegradable plastics are designed to :

(A) Resist microorganisms

(B) Remain unchanged in soil

(C) Break down naturally in the environment

(D) Increase pollution

4. Which principle helps reduce toxic waste in industrial processes ?

(A) Green chemistry

(B) Maximum chemical usage

(C) Increased combustion

(D) Excessive packaging

5. Which method helps remove toxic chemicals from contaminated soil using plants ?

(A) Filtration

(B) Phytoremediation

(C) Incineration

(D) Distillation

6. The main goal of environmental toxicology is to :

(A) Increase industrial chemicals

(B) Promote chemical industries

(C) Increase plastic production

(D) Protect ecosystems and human health from toxic substances

7. The concept of designing safer chemicals that degrade easily in the environment is part of :

(A) Analytical chemistry

(B) Green chemistry

(C) Nuclear chemistry

(D) None of the above

8. Persistent organic pollutants (POPs) are harmful because they :

(A) Decompose very quickly

(B) Are harmless to ecosystems

(C) Accumulate in the environment and living organisms

(D) Only affect soil

9. Which factor speeds up the decomposition process ?

(A) Presence of microorganisms

(B) Low temperature

(C) Dry condition

(D) Lack of oxygen

10. The breakdown of organic matter into simpler substances is called :

(A) Polymerization

(B) Decomposition

(C) Distillation

(D) Neutralization

11. Biodegradation is mainly carried out by :

(A) Minerals

(B) Sunlight

(C) Microorganisms

(D) Wind

12. Which of the following is an example of a biodegradable material ?

(A) Plastic bags

(B) Glass bottles

(C) Aluminum cans

(D) Food waste

13. A chemical that can be broken down by microorganisms into simpler substances is called :

(A) Radioactive chemical

(B) Persistent chemical

(C) Biodegradable chemical

(D) Synthetic polymer

14. Environmental toxicology mainly studies :

(A) Mining of minerals

(B) Marketing of chemical products

(C) Effects of chemicals and pollutants on living organisms and ecosystems

(D) Production of chemicals in industries

15. Winkler method is used to determine :

(A) Dissolved oxygen

(B) Biochemical oxygen demand

(C) Organic carbon

(D) Elemental carbon

16. Fly ash contains large amounts of :

(A) Silica and alumina

(B) Sodium chloride

(C) Magnesium sulfate

(D) Potassium nitrate

17. The best method for solid waste management in industries is :
    (A) Open dumping
    (B) Burning
    (C) Reduce, Reuse, Recycle
    (D) Ocean dumping

18. Which radioactive element is commonly found in nuclear waste ?
    (A) Uranium
    (B) Calcium
    (C) Sodium
    (D) Potassium

19. The process of recovering useful metals from waste is called :
    (A) Neutralization
    (B) Recycling
    (C) Oxidation
    (D) Dilution

20. Radioactive waste should be disposed by :
    (A) Open dumping
    (B) Burning
    (C) Deep geological burial
    (D) Surface storage only

21. Which gas is mainly emitted from thermal power plants burning coal ?
    (A) SO_2
    (B) Nitrogen
    (C) Oxygen
    (D) CH_4

22. The major problem caused by industrial wastewater is :
    (A) Increase in oxygen level
    (B) Increase in drinking water quality
    (C) Decrease in dissolved oxygen in water
    (D) Reduction in pollution

23. Slag is a waste product from :
    (A) Paper and pulp industry
    (B) Metallurgical industry
    (C) Sugar industry
    (D) Drug industry

24. Which industry generates “black liquor” as waste ?
    (A) Sugar industry
    (B) Metallurgy
    (C) Paper and pulp industry
    (D) Metallurgy

25. The main heavy metal released from some drug industries is :
    (A) Hg
    (B) K
    (C) Na
    (D) Ca

26. Fly ash is mainly produced by :
    (A) Cement industry
    (B) Thermal power plant
    (C) Nuclear power plant
    (D) Distillery

27. Radionuclides are commonly analyzed using :

(A) Spectrophotometer

(B) Geiger-Müller counter

(C) pH meter

(D) Conductivity meter

28. Which industry produces radioactive waste ?

(A) Cement industry

(B) Sugar industry

(C) Nuclear power plant

(D) Distillery

29. The major air pollutant released from metallurgical industries is :

(A) Chlorine gas

(B) CH_4

(C) NH_3

(D) Metal fumes and dust

30. The paper and pulp industry mainly releases :

(A) Lignin and chlorinated compound

(B) Cyanide

(C) Mercury

(D) Fluoride

31. The major pollutant released from the cement industry is :

(A) Ammonia

(B) H_2S

(C) CO

(D) Particulate matter(cement dust)

32. The major pollutant in wastewater from sugar industries is :

(A) Radioactive waste

(B) Heavy metals

(C) Oil and grease

(D) High Biological Oxygen Demand (BOD)

33. Which pollutant is mainly produced by petroleum combustion ?

(A) SO_2

(B) CO

(C) NOx

(D) All of the above

34. The ozone layer is mainly located in which part of the atmosphere ?

(A) Troposphere

(B) Stratosphere

(C) Mesosphere

(D) Thermosphere

35. The layer that protects Earth from UV radiation is :

(A) Ozone layer

(B) Troposphere

(C) Stratosphere

(D) Mesosphere

36. Radicals present in the atmosphere are highly :

(A) Neutral

(B) Inert

(C) Reactive

(D) Stable

37. Which of the following contributes to greenhouse effect ?

(A) CO_2

(B) N_2O

(C) CH4

(D) All of the above

38. Catalytic converters in automobiles reduce pollution by converting :

(A) Nitrogen into ammonia

(B) Oxygen into ozone

(C) CO_2 into oxygen

(D) CO and NOx into less harmful gases

39. The reaction of SO_2 with water in the atmosphere forms :

(A) HNO_3

(B) H_2SO_4

(C) H_2CO_3

(D) HCI

40. The device used to remove particulate matter from industrial gases is :

(A) Catalytic converter

(B) Electrostatic precipitator

(C) Cyclone separator

(D) Absorber

41. Which gas is mainly responsible for London smog :

(A) SO_2

(B) CO_2

(C) NO_2

(D) CH_4

42. Which oxide of nitrogen contributes to photochemical smog formation ?

(A) N_2O_5

(B) NO_2

(C) N_2O

(D) NH_3

43. The main source of carbon monoxide pollution is :

(A) Automobile exhaust

(B) Volcanic eruptions

(C) Oceans

(D) Plants

44. PAN (Peroxyacetyl nitrate) is associated with :

(A) Photochemical smog

(B) Acid rain

(C) Ozone depletion

(D) Greenhouse effect

45. Which of the following is not a greenhouse gas ?

(A) CH_4

(B) CO_2

(C) Water vapors

(D) N_2

46. Acid rain mainly contains :

(A) HNO_3 and HCl

(B) HCl and H_2SO_4

(C) H_2SO_4 and HNO_3

(D) H_2SO_4 and HCl

47. Which of the following chemicals causes ozone layer depletion ?

(A) Nitrogen

(B) Carbon monoxide

(C) Methane

(D) Chlorofluorocarbons (CFCs)

48. The greenhouse gas mainly responsible for global warming is :

(A) Oxygen

(B) Nitrogen

(C) Carbon dioxide

(D) Helium

49. Which oxide is mainly responsible for acid rain ?

(A) SO_2

(B) CO_2

(C) NO

(D) N_2O

50. Which of the following is a major component of photochemical smog ?

(A) Methane

(B) Hydrogen

(C) Ozone

(D) Nitrogen

51. Photochemical smog is mainly formed by the reaction of :

(A) SO_2 and CO

(B) NOx and hydrocarbons in sunlight

(C) CO_2 and water vapor

(D) Nitrogen and oxygen

52. The approximate percentage of oxygen in the atmosphere is :

(A) 78%

(B) 21%

(C) 10%

(D) 30%

53. The most abundant gas in the earth's atmosphere is :

(A) Argon

(B) Nitrogen

(C) Oxygen

(D) Carbon dioxide

54. Itai-itai disease is caused by :

(A) Lead

(B) Mercury

(C) Cadmium

(D) Arsenic

55. Which heavy metal causes Minamata disease ?

(A) Lead

(B) Mercury

(C) Cadmium

(D) Chromium

56. Presence of nitrates in drinking water may cause :

(A) Blue baby syndrome

(B) Cancer

(C) Kidney failure

(D) Skin allergy

57. COD measures :

(A) Oxygen needed to oxidize organic matter chemically

(B) Oxygen dissolved in water

(C) Chlorine concentration

(D) Metal contamination

58. BOD stands for :

(A) Biological Oxygen Demand

(B) Biochemical Oxygen Demand

(C) Basic Oxygen Demand

(D) Bacterial Oxygen Demand

59. High BOD indicates :

(A) Clean water

(B) High oxygen content

(C) High organic pollution

(D) Low microbial activity

60. Dissolved Oxygen (DO) indicates :

(A) Amount of carbon dioxide in water

(B) Oxygen available for aquatic organisms

(C) Total salts in water

(D) Organic matter in water

61. Detergents in water mainly cause :

(A) Foam formation

(B) Oil films

(C) Heavy metal contamination

(D) Radiation pollution

62. Oil pollution in oceans mainly occurs due to :

(A) Acid rain

(B) Oil spills

(C) Plastic waste

(D) Fertilizers

63. Which pollutant is mainly responsible for eutrophication ?

(A) Chloride

(B) Phosphate

(C) Carbon monoxide

(D) Nitrogen gas

64. Pollution caused by fertilizers and pesticides mainly comes from :

(A) Industrial waste

(B) Agricultural activities

(C) Domestic waste

(D) Mining

65. The movement of water between Earth's surface and atmosphere is called :

(A) Carbon cycle

(B) Nitrogen cycle

(C) Hydrological cycle

(D) Rock cycle

66. The hydrosphere includes :

(A) Only oceans

(B) Only freshwater bodies

(C) All water present on Earth

(D) Only groundwater

67. Arsenic contamination in water mainly affects :

(A) Skin

(B) Bones

(C) Teeth

(D) Lungs

68. Heavy metals in soil are dangerous because they :

(A) Improve soil fertility

(B) Decompose quickly

(C) Accumulate in organisms

(D) Increase soil porosity

69. Which of the following is considered a heavy metal pollutant in soil ?

(A) Calcium

(B) Magnesium

(C) Lead

(D) Potassium

70. Plastic pollution in soil mainly leads to :

(A) Increased soil permeability

(B) Reduced soil fertility and water movement

(C) Increased microbial growth

(D) Increased plant nutrients

71. The major environmental problem associated with pesticides is :

(A) Biomagnification

(B) Soil erosion

(C) Increased soil moisture

(D) Soil aeration

72. Which of the following is a harmful pesticide known for long persistence in soil ?

(A) Urea

(B) Gypsum

(C) Compost

(D) DDT

73. World Environment Day is :

(A) 22 April

(B) 5 June

(C) 16 September

(D) 21 March

74. Bioremediation involves :

(A) Using microorganisms to degrade pollutants

(B) Using chemicals to remove pollutants

(C) Burning sol contaminants

(D) None of the above

75. The best method to reduce soil pollution from organic waste is :

(A) Landfilling

(B) Composting

(C) Burning

(D) Dumping in rivers

76. Composting is a method used for :

(A) Plastic disposal

(B) Removing heavy metal

(C) Converting organic waste into manure

(D) Producing chemical fertilizers

77. Long term use of chemical fertilizers may result in :

(A) Higher earthworm pollution

(B) Increase soil diversity

(C) Soil structure improvement

(D) Soil acidification

78. Nitrate accumulation in soil and water is mainly due :

(A) Chemical fertilizer

(B) Organic manure

(C) Sand deposition

(D) Irrigation

79. Arsenic commonly occurs in :

(A) Insecticide

(B) Fungicide

(C) Herbicide

(D) All of the above

80. Sulphurous smog is also known as

(A) Photochemical smog

(B) London smog

(C) Los Angeles smog

(D) Urban smog

81. Secondary pollutants are mainly formed by reactions involving :

(A) Water and soil

(B) Sunlight and primary pollutant

(C) Oceans and rivers

(D) Plant and animals

82. Peroxyacetyl nitrate (PAN) is an example of :

(A) Primary pollutant

(B) Secondary pollutant

(C) Radioactive pollutant

(D) Water pollutant

83. What is a secondary pollutant ?

(A) Pollutant formed by chemical reactions in the atmosphere

(B) Pollutant directly emitted from vehicles

(C) Pollutant released from industries only

(D) Natural gases in the atmosphere

84. Which aerosol contains liquid particles dispersed in gas ?

(A) Smoke

(B) Solid foam

(C) Mist

(D) Gel

85. Particulate pollutants can cause :

(A) Skin cancer only

(B) Respiratory diseases

(C) Hearing problem

(D) Bone fracture

86. Which of the following is an example of particulate pollutant ?

(A) Smoke

(B) Carbon dioxide

(C) Sulfur dioxide

(D) Ozone

87. Particulate pollutants mainly consist of :

(A) Only gases

(B) Only liquid droplets

(C) Solid and liquid particles suspended in air

(D) Only dust

88. Increased UV radiation due to ozone depletion can cause :

(A) Skin cancer

(B) Cataracts

(C) Damage to crops

(D) All of the above

89. The "ozone hole" is mainly observed over which region ?

(A) Arctic

(B) Asia

(C) Europe

(D) Antarctica

90. The term greenhouse effect was coined by :

(A) Robert Angus smith

(B) J. Fourier

(C) U.S. Pilot

(D) Max Plank

91. Which of the following gases is present in the smallest concentration in the atmosphere ?

(A) Oxygen

(B) Nitrogen

(C) Carbon dioxide

(D) Neon

92. Which inert gas present in the highest concentration in the atmosphere ?

(A) Helium
(B) Neon
(C) Argon
(D) Krypton

93. Environmental chemistry of Se is similar to that of :

(A) Oxygen
(B) Carbon
(C) Phosphorus
(D) Sulfur

94. Oxygen cycle is closely linked with :

(A) Carbon cycle
(B) Nitrogen cycle
(C) Sulfur cycle
(D) Phosphorus cycle

95. The process that converts nitrate into nitrogen gas is :

(A) Denitrification
(B) Nitrification
(C) Nitrogen fixation
(D) Ammonification

96. Sulfur enters the atmosphere through :

(A) Photosynthesis
(B) Volcanic activity
(C) Weathering of rocks
(D) Both (B) and (C)

97. Phosphorus cycle differs from other cycles because :

(A) It occurs only in oceans
(B) Phosphorus cycle lacks a significant gaseous phase
(C) It has no biological phase
(D) It occurs only in soil

98. The main reservoir of phosphorus in the phosphorus cycle :

(A) Atmosphere
(B) Oceans
(C) Phosphate minerals in rocks
(D) Plants

99. Which process converts atmospheric nitrogen into ammonia ?

(A) Nitrification
(B) Denitrification
(C) Nitrogen fixation
(D) Amonification

100. The movement of elements between living organisms and the environment is called :

(A) Food chain
(B) Energy flow
(C) Ecosystem balance
(D) Biogeochemical cycle

(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 छाँटना 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।