Roll No. .....

Question Booklet Number

O. M. R. Serial No.

M. Sc. (Biotechnology) (Fourth Semester)
(NEP) EXAMINATION, 2025-26
ENVIRONMENTAL BIOTECHNOLOGY

Paper Code							
L	0	3	1	0	0	6	T

Questions Booklet Series
B

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 is a heavy metal pollutant ?

(A) Sodium

(B) Mercury

(C) Oxygen

(D) Nitrogen

2. Biomagnification occurs with :

(A) Nutrients

(B) Heavy metals

(C) Oxygen

(D) Water

3. Drug pollutants mainly enter water through :

(A) Rain

(B) Industrial discharge

(C) Human and animal waste

(D) Soil erosion

4. Antibiotics in water can cause :

(A) Oxygen increase

(B) Resistance in microbes

(C) Water purification

(D) Temperature rise

5. Pulp and paper industry releases :

(A) Oxygen

(B) Lignin-rich effluents

(C) Nitrogen gas

(D) Hydrogen gas

6. Sugar mill effluent is rich in :

(A) Organic matter

(B) Oxygen

(C) Metals

(D) Salts

7. Industrial effluents mainly increase :

(A) DO

(B) BOD

(C) pH neutrality

(D) Transparency

8. Electrostatic precipitator removes :

(A) Gases

(B) Particles

(C) Water

(D) Heat

9. Scrubber is used to remove :

(A) Solid waste

(B) Gaseous pollutants

(C) Water pollutants

(D) Soil pollutants

10. UV radiation causes :

(A) Bone growth

(B) Skin cancer

(C) Oxygen formation

(D) Rainfall

11. Gamma rays are :

(A) Low energy

(B) Non-ionizing

(C) Highly penetrating

(D) Harmless

12. Ozone layer protects from :

(A) Infrared rays

(B) UV rays

(C) Visible light

(D) Gamma rays

13. Ozone hole is mainly caused by :

(A) CO_2

(B) CFCs

(C) Oxygen

(D) Nitrogen

14. Greenhouse effect loads in :

(A) Cooling

(B) Global warming

(C) Rainfall decrease

(D) Ozone formation

15. Biodegradable pollutants are :

(A) Non-decomposable

(B) Easily decomposed by microbes

(C) Toxic metals

(D) Plastics

16. Non-degradable pollutants include :

(A) Paper

(B) Food waste

(C) Plastics

(D) Leaves

17. Primary treatment removes :

(A) Dissolved solids

(B) Suspended solids

(C) Microbes

(D) Nutrients

18. Secondary treatment involves :

(A) Filtration

(B) Biological processes

(C) Chlorination only

(D) Heating

19. Activated sludge process is used in :

(A) Primary treatment

(B) Secondary treatment

(C) Tertiary treatment

(D) Disinfection

20. Tertiary treatment mainly removes :

(A) Large particles

(B) Organic matter

(C) Nutrients and pathogens

(D) Sand

21. Toxicity of agrochemicals in plants mainly affects :

(A) Photosynthesis

(B) Respiration only

(C) Transpiration only

(D) Growth only

22. Bioaccumulation refers to :

(A) Breakdown of toxins.

(B) Accumulation of toxic substances in organisms

(C) Removal of toxins

(D) Dilution of pollutants

23. Pesticides mainly enter animals through :

(A) Respiration only

(B) Food chain

(C) Skin only

(D) Water only

24. Free radicals are :

(A) Stable molecules

(B) Highly reactive molecules with unpaired electrons

(C) Non-reactive ions

(D) Neutral compounds

25. Free radicals can cause :

(A) DNA damage

(B) Protein synthesis

(C) Energy production

(D) Water formation

26. Antioxidants act as :

(A) Toxins

(B) Free radical scavengers

(C) Pollutants

(D) Enzymes only

27. Xenobiotics are :

(A) Natural nutrients

(B) Foreign chemical substances

(C) Vitamins

(D) Minerals

28. Which is an example of xenobiotic ?

(A) Glucose

(B) Protein

(C) Pesticide

(D) Amino acid

29. Bioremediation involves :

(A) Chemical treatment

(B) Use of organisms to remove pollutants

(C) Physical filtration

(D) Burning waste

30. Microorganisms used in bioremediation mainly :

(A) Produce toxins

(B) Degrade pollutants

(C) increase pollution

(D) Stop metabolism

31. Phytoremediation uses :

(A) Animals

(B) Plants

(C) Fungi only

(D) Chemicals

32. Vermiculture refers to :

(A) Fish farming

(B) Earthworm culture

(C) Plant breeding

(D) Microbial culture

33. Vermicompost improves :

(A) Air pollution

(B) Soil fertility

(C) Water pollution

(D) Noise pollution

34. Environmental monitoring involves :

(A) Ignoring pollution

(B) Measuring environmental quality

(C) Producing pollutants

(D) Removing species

35. Bioindicators are :

(A) Machines

(B) Chemicals

(C) Organisms indicating environmental health

(D) Minerals

36. Enzymes involved in detoxification include :

(A) Lipase

(B) Cytochrome P450

(C) Amylase

(D) Pepsin

37. Detoxification mainly occurs in :

(A) Brain

(B) Liver

(C) Heart

(D) Lungs

38. Ecosystem analysis studies :

(A) Only plants

(B) Only animals

(C) Structure and function of ecosystem

(D) Only microbes

39. Energy flow in ecosystem is :

(A) Cyclic

(B) Linear (unidirectional)

(C) Random

(D) Static

40. Nutrient cycling is :

(A) One-way process

(B) Cyclic process

(C) Random process

(D) Linear process

41. Acute toxicity refers to :

(A) Long-term exposure

(B) Immediate harmful effects after short exposure

(C) Genetic mutation

(D) Slow poisoning

42. Chronic toxicity is caused by :

(A) Single high dose

(B) Short-term exposure

(C) Long-term repeated exposure

(D) Sudden poisoning

43. Sub-acute toxicity refers to :

(A) Very long-term exposure

(B) Moderate exposure over short duration

(C) Immediate death

(D) No effect

44. LD_{50} represents :

(A) Lethal dose for 50% population

(B) Safe dose

(C) Maximum dose

(D) Minimum dose

45. Which test is used for chronic toxicity ?

(A) Single-dose test

(B) Long-term exposure study

(C) Skin test only

(D) Rapid test

46. Carcinogenic substances cause :

(A) Mutation

(B) Cancer

(C) Birth defects

(D) Allergy

47. Mutagenic agents affect :

(A) Skin

(B) DNA

(C) Bones

(D) Muscles

48. Teratogenic agents cause :

(A) Cancer

(B) Genetic mutation

(C) Birth defects in fetus

(D) Liver damage

49. Antidotes work by :

(A) Increasing toxicity

(B) Neutralizing or counteracting toxins

(C) Producing toxins

(D) Increasing absorption

50. Activated charcoal acts by :

(A) Chemical neutralization

(B) Adsorption of toxins

(C) Increasing metabolism

(D) Destroying organs

51. Ecology is the study of :

(A) Rocks

(B) Human anatomy

(C) Interaction between organisms and environment

(D) Weather patterns

52. Which of the following is a biotic factor ?

(A) Temperature

(B) Light

(C) Soil

(D) Plants

53. Abiotic factors include :

(A) Animals

(B) Microorganisms

(C) Water and temperature

(D) Plants

54. The biosphere includes :

(A) Only land

(B) Only water

(C) All Living organisms and their environment

(D) Only atmosphere

55. Producers belong to which trophic level ?

(A) First

(B) Second

(C) Third

(D) Fourth

56. Primary consumers are :

(A) Carnivores

(B) Herbivores

(C) Decomposers

(D) Omnivores

57. Pyramid of energy is always :

(A) Inverted

(B) Upright

(C) Circular

(D) Horizontal

58. Pyramid of biomass is inverted in :

(A) Forest ecosystem

(B) Grassland ecosystem

(C) Aquatic ecosystem

(D) Desert ecosystem

59. A food web consists of :

(A) Single food chain

(B) Multiple interconnected food chains

(C) Only producers

(D) Only consumers

60. Which is a natural ecosystem ?

(A) Aquarium

(B) Garden

(C) Forest

(D) Crop field

61. Ecological succession refers to :

(A) Energy flow

(B) Seasonal changes

(C) Gradual change in species composition

(D) Population decrease

62. The first species to colonize a barren area are called :

(A) Climax species

(B) Pioneer species

(C) Dominant species

(D) Secondary species

63. Habitat is :

(A) Role of organism

(B) Place where organism lives

(C) Food habit

(D) Reproductive behavior

64. Ecological niche refers to :

(A) Physical space

(B) Functional role of species

(C) Population size

(D) Climate

65. Primary productivity is :

(A) Energy used by consumers

(B) Rate of biomass production by producers

(C) Decomposition rate

(D) Respiration rate

66. Standing crop refers to :

(A) Rate of production

(B) Total biomass at a given time

(C) Energy flow

(D) Nutrient cycling

67. Lichens are indicators of :

(A) Water pollution

(B) Soil fertility

(C) Air pollution

(D) Temperature

68. Ecological efficiency is approximately :

(A) 1%

(B) 10%

(C) 50%

(D) 90%

69. Edge effect refers to :

(A) Decrease in biodiversity at boundaries

(B) Increase in biodiversity at boundaries

(C) No change in biodiversity

(D) Extinction of species

70. Which cycle involves nitrogen fixation ?

(A) Carbon cycle

(B) Oxygen cycle

(C) Nitrogen cycle

(D) Water cycle

71. Population ecology deals with :

(A) Individual organisms

(B) Population interactions and dynamics

(C) Only plants

(D) Only animals

72. Which is NOT a characteristic of population ?

(A) Density

(B) Natality

(C) Photosynthesis

(D) Mortality

73. Population density is defined as :

(A) Number of species

(B) Number of individuals per unit area

(C) Biomass of ecosystem

(D) Energy flow

74. Density-dependent factors include :

(A) Flood

(B) Temperature

(C) Competition

(D) Earthquake

75. Which is density-independent factor ?

(A) Predation

(B) Disease

(C) Competition

(D) Natural disasters

76. Logistic growth curve is :

(A) J-shaped

(B) S-shaped

(C) Linear

(D) Circular

77. Frequency refers to :

(A) Biomass

(B) Occurrence of species in samples

(C) Growth rate

(D) Energy flow

78. Density in plant community means :

(A) Size of plant

(B) Number of individuals per unit area

(C) Height of plant

(D) Productivity

79. Dominance is measured by :

(A) Height only

(B) Biomass or basal area

(C) Leaf number

(D) Root length

80. A biotic community consists of :

(A) Only plants

(B) Only animals

(C) All living organisms in an area

(D) Only microbes

81. Which is a characteristic of a community ?

(A) Trophic structure

(B) Density only

(C) Individual growth

(D) Mutation

82. Ecological succession is :

(A) Sudden change

(B) Gradual change in community structure

(C) Seasonal variation

(D) Migration

83. The intermediate stages in succession are called :

(A) Climax

(B) Sere

(C) Pioneer

(D) Niche

84. Final stable community is :

(A) Pioneer community

(B) Climax community

(C) Transitional community

(D) Temporary community

85. uccession may be caused by :

(A) Climatic factors

(B) Biotic factors

(C) Edaphic factors

(D) All of the above

86. Primary succession occurs on :

(A) Previously vegetated land

(B) Barren land

(C) Grassland

(D) Forest

87. Secondary succession occurs on :

(A) Bare rock

(B) Lava

(C) Previously occupied land

(D) Desert

88. Climax community is characterized by :

(A) Instability

(B) High biodiversity and stability

(C) Low biomass

(D) Rapid change

89. Evolutionary ecology studies :

(A) Cell structure

(B) Evolution of species in relation to environment

(C) Chemical reactions

(D) Genetics only

90. Natural selection in ecology results in :

(A) Random survival

(B) Adaptation to environment

(C) Extinction only

(D) No change

91. The major component of air pollution is :

(A) Oxygen

(B) Nitrogen

(C) Particulate matter

(D) Hydrogen

92. Which gas causes acid rain ?

(A) CO_2

(B) SO_2

(C) O_2

(D) N_2

93. Biological Oxygen Demand (BOD) Indicates :

(A) Oxygen in air

(B) Organic pollution in water

(C) pH level

(D) Temperature

94. Eutrophication is caused by excess :

(A) Oxygen

(B) Nutrients

(C) Carbon dioxide

(D) Nitrogen gas

95. Lignin is mainly present in :

(A) Animal tissue

(B) Plant cell wall

(C) Water

(D) Soil minerals

96. Lignin degradation is slow because it is :

(A) Soluble

(B) Complex polymer

(C) Acidic

(D) Basic

97. Detergents cause pollution mainly due to :

(A) High oxygen

(B) Phosphates

(C) Nitrogen gas

(D) Hydrogen

98. Non-biodegradable detergents lead to :

(A) Water purification

(B) Foam formation

(C) Oxygen increase

(D) Nutrient depletion

99. Industrial dyes mainly affect :

(A) Soil color only

(B) Water quality

(C) Air pressure

(D) Temperature

100. Dye pollution reduces :

(A) Oxygen solubility

(B) Water density

(C) Soil pH

(D) Air pressure

(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।