

Roll No.

Question Booklet Number

O. M. R. Serial No.

--	--	--	--	--	--	--	--

M. Sc. (Biochemistry) (Fourth Semester)
EXAMINATION, 2025-26
(Old Syllabus Effective from 2022)
(Only Back Paper Students)
ENVIRONMENTAL BIOCHEMISTRY

Paper Code						
L	0	2	1	0	0	1 T

Questions Booklet
Series

D

Time : 1:30 Hours]

[Maximum Marks : 75

Instructions to the Examinee :

परीक्षार्थियों के लिए निर्देश :

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.

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 describes acute toxicity ?
 - (A) Toxic effects appearing shortly after exposure
 - (B) Effects after long-term exposure
 - (C) Effects after repeated low doses
 - (D) Effects after genetic mutation
2. Which of the following is a pollutant from TNT manufacturing ?
 - (A) Alcohols
 - (B) Nitroaromatics
 - (C) Ketones
 - (D) Esters
3. Which of the following pollutants is remediated by vermiculture ?
 - (A) Heavy metals
 - (B) Radioactive waste
 - (C) Plastic debris
 - (D) Organic waste
4. Population density refers to :
 - (A) Number of individuals per unit area
 - (B) Total biomass
 - (C) Birth rate
 - (D) Growth rate
5. Which of the following is a biochemical marker of oxidative stress ?
 - (A) Glucose
 - (B) Albumin
 - (C) Hemoglobin
 - (D) Malondialdehyde
6. Which of the following is a feature of a biome ?
 - (A) Species richness
 - (B) Trophic structure
 - (C) Climate and vegetation
 - (D) Stratification
7. Which of the following pollutants is remediated by bioaugmentation ?
 - (A) Oxygen
 - (B) Nitrogen
 - (C) Water
 - (D) TNT
8. Which of the following is a pollutant from detergent industries ?
 - (A) Proteins
 - (B) Sugars
 - (C) Surfactants
 - (D) Lipids
9. Which of the following defines population ecology ?
 - (A) Study of soil composition
 - (B) Study of population dynamics
 - (C) Study of climate
 - (D) Study of water cycle

10. Which term describes the gradual replacement of one community by another ?
- (A) Ecological succession
 - (B) Evolution
 - (C) Migration
 - (D) Speciation
11. Standing crop refers to :
- (A) Biomass present at a given time
 - (B) Rate of energy flow
 - (C) Number of species
 - (D) Population density
12. Which of the following describes chronic toxicity ?
- (A) Immediate effects
 - (B) Long-term exposure effects
 - (C) Short-term exposure
 - (D) Genetic mutation
13. Which tool is used in environmental monitoring ?
- (A) Centrifuge
 - (B) Spectrometer
 - (C) Incubator
 - (D) Biosensor
14. Which of the following is a pollutant remediated in situ ?
- (A) Arsenic
 - (B) Oxygen
 - (C) Nitrogen
 - (D) Water
15. Which of the following is used to treat wastewater biologically ?
- (A) Electrolysis
 - (B) Activated sludge process
 - (C) Chromatography
 - (D) PCR
16. Which of the following is a producer in aquatic ecosystems ?
- (A) Zooplankton
 - (B) Fish
 - (C) Phytoplankton
 - (D) Crustaceans
17. Which of the following ecosystems has the highest net primary productivity ?
- (A) Desert
 - (B) Tundra
 - (C) Estuary
 - (D) Grassland
18. Which of the following is a standing crop measure ?
- (A) Population density
 - (B) Biomass per unit area
 - (C) Species diversity
 - (D) Trophic level

19. Which of the following is not a component of the biosphere ?
- (A) Lithosphere
 - (B) Hydrosphere
 - (C) Atmosphere
 - (D) Moon surface
20. Which of the following is a biochemical marker of oxidative stress ?
- (A) Malondialdehyde
 - (B) Glucose
 - (C) Albumin
 - (D) Hemoglobin
21. Which of the following is a harmful effect of gamma rays ?
- (A) DNA damage
 - (B) Protein synthesis
 - (C) Enzyme activation
 - (D) Photosynthesis
22. Which of the following is not a feature of the biotic community ?
- (A) Species richness
 - (B) Dominance
 - (C) Stratification
 - (D) Mineral composition
23. The biosphere includes :
- (A) All living organisms and their environments
 - (B) Only terrestrial ecosystems
 - (C) Only aquatic ecosystems
 - (D) Only atmospheric layers
24. Which of the following is a test for acute toxicity ?
- (A) ELISA
 - (B) LD50 test
 - (C) PCR
 - (D) Western blot
25. Which pollutant is remediated by bacteria ?
- (A) Oxygen
 - (B) Nitrogen
 - (C) Water
 - (D) Chromium
26. Which of the following is a pollutant from pharmaceutical industries ?
- (A) Vitamins
 - (B) Drug residues
 - (C) Minerals
 - (D) Enzymes

27. Which of the following best defines a biotic community ?
- (A) Group of interacting organisms in a habitat
 - (B) Abiotic factors in an ecosystem
 - (C) Population of a single species
 - (D) Food web structure
28. Which of the following is a pollutant remediated ex situ ?
- (A) Mercury
 - (B) Oxygen
 - (C) Nitrogen
 - (D) Water
29. Which of the following is a strategy in bioremediation ?
- (A) Chlorination
 - (B) Biostimulation
 - (C) Sedimentation
 - (D) Filtration
30. Which of the following pollutants is commonly released by dye industries ?
- (A) Heavy metals
 - (B) Pesticides
 - (C) Fertilizers
 - (D) Azo compounds
31. Which of the following regulates population size ?
- (A) Carrying capacity
 - (B) Migration
 - (C) Mutation
 - (D) Speciation
32. Which of the following is a xenobiotic compound ?
- (A) Pesticide
 - (B) Glucose
 - (C) Amino acid
 - (D) Vitamin C
33. Which of the following is a characteristic of logistic growth ?
- (A) Constant growth rate
 - (B) Unlimited resources
 - (C) Growth slows as population nears carrying capacity
 - (D) No environmental resistance
34. Which pyramid is always upright in an ecosystem ?
- (A) Pyramid of energy
 - (B) Pyramid of biomass
 - (C) Pyramid of numbers
 - (D) Pyramid of productivity

35. Which of the following pollutants is remediated by biostimulation ?
- (A) Oxygen
 - (B) Nitrogen
 - (C) Water
 - (D) Pesticides
36. Which of the following is a toxic effect of free radicals ?
- (A) Lipid peroxidation
 - (B) Protein folding
 - (C) DNA methylation
 - (D) RNA synthesis
37. Which of the following is used to analyze pollutant impact ?
- (A) Environmental impact assessment
 - (B) DNA fingerprinting
 - (C) ELISA
 - (D) Western blot
38. Which of the following is a pollutant from dye industries ?
- (A) Ethanol
 - (B) Aromatic amines
 - (C) Acetic acid
 - (D) Methane
39. Which of the following best describes a climax community ?
- (A) Dominated by pioneer species
 - (B) Stable and self-perpetuating
 - (C) Frequently disturbed
 - (D) Low biodiversity
40. Which of the following is a pollutant from sugar mills ?
- (A) Ethanol
 - (B) Acetic acid
 - (C) Methane
 - (D) Molasses
41. Which of the following is a biotic component of an ecosystem ?
- (A) Fungi
 - (B) Temperature
 - (C) Water
 - (D) Soil
42. Which of the following pollutants is carcinogenic ?
- (A) Sodium chloride
 - (B) Polycyclic aromatic hydrocarbons (PAHs)
 - (C) Calcium carbonate
 - (D) Magnesium sulfate

43. Which of the following is a metabolic effect of heavy metals ?
- (A) Enzyme inhibition
 - (B) DNA replication
 - (C) Protein synthesis
 - (D) Cell division
44. Which of the following is a density-independent factor ?
- (A) Disease
 - (B) Predation
 - (C) Earthquake
 - (D) Competition
45. Which of the following affects ecological efficiency ?
- (A) Predator population
 - (B) Energy transfer between trophic levels
 - (C) Migration
 - (D) Mutation rate
46. Which is a biochemical aspect of bioremediation ?
- (A) Physical adsorption
 - (B) Enzyme activity
 - (C) Thermal breakdown
 - (D) Mechanical filtration
47. Which of the following pollutants contributes to ozone hole formation ?
- (A) Chlorofluorocarbons (CFCs)
 - (B) Carbon monoxide
 - (C) Nitrogen
 - (D) Methane
48. Which of the following best describes a trophic level ?
- (A) A group of organisms sharing the same function in a food chain
 - (B) The total biomass of an ecosystem
 - (C) The rate of energy flow in a community
 - (D) The number of species in a habitat
49. Which of the following is a pollutant from paper mills ?
- (A) Glucose
 - (B) Cellulose
 - (C) Chlorinated compounds
 - (D) Starch
50. Which of the following is not a method of population regulation ?
- (A) Photosynthesis
 - (B) Predation
 - (C) Disease
 - (D) Competition

51. Which of the following is a heavy metal pollutant ?
- (A) Lead
 - (B) Sodium
 - (C) Potassium
 - (D) Calcium
52. Which pollutant inhibits photosynthesis ?
- (A) Agrochemicals
 - (B) Oxygen
 - (C) Nitrogen
 - (D) Water
53. Which of the following is a climax community trait ?
- (A) High productivity
 - (B) Low biodiversity
 - (C) Frequent disturbances
 - (D) Stability
54. Which of the following is a radionuclide pollutant ?
- (A) Sodium
 - (B) Potassium
 - (C) Calcium
 - (D) Uranium
55. Which of the following is an example of ecological indicator species ?
- (A) Lichen
 - (B) Earthworm
 - (C) Grasshopper
 - (D) Butterfly
56. Which of the following is a pollution control device ?
- (A) Centrifuge
 - (B) Scrubber
 - (C) Spectrometer
 - (D) Incinerator
57. Which of the following is a component of the biosphere ?
- (A) Hydrosphere
 - (B) Moon surface
 - (C) Crust
 - (D) Mantle
58. Which of the following is a pioneer species in primary succession ?
- (A) Grass
 - (B) Shrub
 - (C) Lichen
 - (D) Pine tree
59. Which organism is used in vermiculture ?
- (A) Bacteria
 - (B) Fungi
 - (C) Red worm
 - (D) Algae

60. Which of the following is a primary succession site ?
- (A) Forest floor
 - (B) Lava bed
 - (C) Grassland
 - (D) Abandoned farmland
61. Which factor is density-dependent ?
- (A) Temperature
 - (B) Flood
 - (C) Predation
 - (D) Earthquake
62. Which of the following is a major air pollutant ?
- (A) Sulfur dioxide
 - (B) Sodium chloride
 - (C) Calcium carbonate
 - (D) Magnesium sulfate
63. Which of the following is a biogeochemical cycle ?
- (A) Food chain
 - (B) Nitrogen cycle
 - (C) Pyramid of energy
 - (D) Ecological succession
64. Which of the following is a cause of ecological succession ?
- (A) Stable climate
 - (B) Constant population
 - (C) Disturbance
 - (D) Uniform soil
65. Which of the following is a limiting factor in aquatic ecosystems ?
- (A) Dissolved oxygen
 - (B) Predator population
 - (C) Migration
 - (D) Nesting sites
66. Which of the following is used to measure species diversity ?
- (A) Biomass estimation
 - (B) Shannon index
 - (C) Trophic level count
 - (D) Quadrat size
67. Which vitamin acts as a free radical scavenger ?
- (A) Vitamin A
 - (B) Vitamin D
 - (C) Vitamin E
 - (D) Vitamin K
68. Which factor affects population size independently of density ?
- (A) Predation
 - (B) Earthquake
 - (C) Disease
 - (D) Competition

69. Which of the following is a pyramid type in ecology ?
- (A) Pyramid of respiration
 - (B) Pyramid of diversity
 - (C) Pyramid of biomass
 - (D) Pyramid of migration
70. Which of the following is a decomposer ?
- (A) Cow
 - (B) Eagle
 - (C) Snake
 - (D) Bacteria
71. Which of the following is a characteristic of a niche ?
- (A) Only habitat
 - (B) Only diet
 - (C) Only behavior
 - (D) Includes habitat, diet, and behavior
72. Which of the following is a biotic factor influencing succession ?
- (A) Temperature
 - (B) Competition
 - (C) Soil pH
 - (D) Rainfall
73. Which of the following is a biodegradable pollutant ?
- (A) Mercury
 - (B) DDT
 - (C) Lead
 - (D) Cellulose
74. Which of the following is a xenobiotic ?
- (A) DDT
 - (B) Glucose
 - (C) Amino acid
 - (D) Vitamin C
75. Which of the following is a biogeochemical cycle ?
- (A) Carbon cycle
 - (B) Food chain
 - (C) Pyramid of energy
 - (D) Ecological succession
76. Which of the following pollutants is mutagenic ?
- (A) Ethanol
 - (B) Glucose
 - (C) Benzene
 - (D) Sucrose

77. Which of the following is a common water pollutant ?
- (A) Industrial effluents
 - (B) Oxygen
 - (C) Carbon dioxide
 - (D) Nitrogen gas
78. Which of the following is a biotic community feature ?
- (A) Soil texture
 - (B) Trophic structure
 - (C) Stratification
 - (D) Mineral composition
79. Which of the following is a producer in a food web ?
- (A) Green plants
 - (B) Fungi
 - (C) Lion
 - (D) Vulture
80. Which of the following contributes to the greenhouse effect ?
- (A) Oxygen
 - (B) Nitrogen
 - (C) Argon
 - (D) Methane
81. Which of the following is a major abiotic factor in desert ecosystems ?
- (A) Temperature
 - (B) Predation
 - (C) Competition
 - (D) Parasitism
82. Which of the following is true about population growth curve ?
- (A) Exponential growth is sustainable
 - (B) Growth curve is always linear
 - (C) Logistic growth shows a plateau phase
 - (D) Carrying capacity increases indefinitely
83. Which of the following is used to analyze plant communities ?
- (A) PCR
 - (B) Line transect
 - (C) ELISA
 - (D) Western blot
84. Which of the following pollutants is commonly found in detergents ?
- (A) Sulfates
 - (B) Phosphates
 - (C) Nitrates
 - (D) Chlorides

85. Which factor affects productivity in an ecosystem ?
- (A) Light intensity
 - (B) Predator population
 - (C) Migration
 - (D) Mutation rate
86. Which of the following is a method of quantitative analysis of plant communities ?
- (A) PCR
 - (B) ELISA
 - (C) Quadrat method
 - (D) Western blot
87. Which of the following is not involved in evolutionary ecology ?
- (A) Natural selection
 - (B) Genetic drift
 - (C) Plate tectonics
 - (D) Gene flow
88. Which of the following contributes to ozone hole formation ?
- (A) Carbon monoxide
 - (B) CFCs
 - (C) Nitrogen
 - (D) Methane
89. Which of the following is a feature of evolutionary ecology ?
- (A) Food chain dynamics
 - (B) Water cycle
 - (C) Natural selection in ecosystems
 - (D) Soil erosion
90. Which of the following is a mutagenic testing agent ?
- (A) ELISA
 - (B) SDS-PAGE
 - (C) Spectrophotometry
 - (D) Ames test
91. Which of the following is a climax species ?
- (A) Oak tree
 - (B) Lichen
 - (C) Moss
 - (D) Algae
92. Which of the following is a test for sub-acute toxicity ?
- (A) Gram staining
 - (B) 28-day repeated dose study
 - (C) ELISA
 - (D) PCR

93. Which of the following best describes a niche ?
- (A) Population size
 - (B) Physical location of an organism
 - (C) Food preference of an organism
 - (D) Functional role of an organism in its ecosystem
94. Which of the following is a pollutant remediated by bacteria ?
- (A) Oxygen
 - (B) Selenium
 - (C) Nitrogen
 - (D) Water
95. Which of the following is a method of pollution control ?
- (A) Spectrophotometry
 - (B) Centrifugation
 - (C) Electrostatic precipitator
 - (D) PCR
96. Which of the following is a pioneer species in secondary succession ?
- (A) Oak tree
 - (B) Grass
 - (C) Shrub
 - (D) Lichen
97. Which of the following is a pollutant remediated by bioaugmentation ?
- (A) Water
 - (B) Oxygen
 - (C) Nitrogen
 - (D) PCBs
98. Which of the following is a toxic effect of free radicals ?
- (A) Protein folding
 - (B) DNA methylation
 - (C) RNA synthesis
 - (D) Lipid peroxidation
99. Which of the following is a sere stage ?
- (A) Intermediate succession phase
 - (B) Climax community
 - (C) Pioneer species
 - (D) Abiotic factor
100. The term 'habitat' refers to :
- (A) The food an organism consumes.
 - (B) The role of an organism in an ecosystem.
 - (C) The physical environment where an organism lives.
 - (D) The population density of a species.

(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।