

Roll No.

Question Booklet Number

O. M. R. Serial No.

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

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. Abscisic acid causes :
 - (A) Growth
 - (B) Dormancy
 - (C) Division
 - (D) Germination
2. Accessory pigments include :
 - (A) Chlorophyll a
 - (B) Lipids
 - (C) Proteins
 - (D) Carotenoids
3. Alkaloids are :
 - (A) Primary metabolites
 - (B) Secondary metabolites
 - (C) Proteins
 - (D) Lipids
4. Ammonia assimilation occurs via :
 - (A) GS-GOGAT pathway
 - (B) Glycolysis
 - (C) Krebs cycle
 - (D) ETC
5. Antioxidants in plants include :
 - (A) Vitamin C
 - (B) Vitamin E
 - (C) Carotenoids
 - (D) All of the above
6. ATP is generated in ETC by :
 - (A) Substrate-level phosphorylation
 - (B) Oxidative phosphorylation
 - (C) Photophosphorylation
 - (D) Hydrolysis
7. ATP is produced in :
 - (A) Dark reaction
 - (B) Light reaction
 - (C) Glycolysis
 - (D) Respiration only
8. ATP synthase is located in :
 - (A) Thylakoid membrane
 - (B) Cytoplasm
 - (C) Nucleus
 - (D) Golgi

9. ATP synthesis occurs in :
- (A) Mitochondria
 - (B) Chloroplast
 - (C) Both (A) and (B)
 - (D) None of the above
10. Auxin promotes :
- (A) Cell elongation
 - (B) Cell death
 - (C) Respiration
 - (D) Photosynthesis
11. Beta-oxidation occurs in :
- (A) Cytoplasm
 - (B) Peroxisome
 - (C) Nucleus
 - (D) Chloroplast
12. Bundle sheath cells are prominent in :
- (A) C₃ plants
 - (B) CAM plants
 - (C) C₄ plants
 - (D) All of the above
13. C₄ plants minimize :
- (A) Photosynthesis
 - (B) Photorespiration
 - (C) Respiration
 - (D) Transpiration
14. Calcium acts as :
- (A) Secondary messenger
 - (B) Hormone
 - (C) Enzyme
 - (D) Pigment
15. CAM plants open stomata at :
- (A) Day
 - (B) Night
 - (C) Noon
 - (D) Evening
16. Catalase converts :
- (A) H₂O₂ to H₂O + O₂
 - (B) CO₂ to O₂
 - (C) ATP to ADP
 - (D) NADH to NAD⁺

17. Chemiosmotic theory was proposed by :
- (A) Krebs
 - (B) Mitchell
 - (C) Calvin
 - (D) Hill
18. Chlorophyll absorbs mainly :
- (A) Green light
 - (B) Yellow light
 - (C) Red and blue light
 - (D) Infrared
19. Chloroplast DNA is :
- (A) Linear
 - (B) Circular
 - (C) Single-stranded
 - (D) Absent
20. CO₂ fixation occurs in :
- (A) Light reaction
 - (B) ETC
 - (C) Glycolysis
 - (D) Calvin cycle
21. Cyclic photophosphorylation produces :
- (A) ATP only
 - (B) NADPH only
 - (C) Both (A) and (B)
 - (D) None of the above
22. Cytochrome complex transfers :
- (A) Electrons
 - (B) Protons
 - (C) Both (A) and (B)
 - (D) None of the above
23. Cytokinins promote :
- (A) Cell division
 - (B) Aging
 - (C) Respiration
 - (D) Death
24. Dark reaction occurs in :
- (A) Thylakoid
 - (B) Stroma
 - (C) Cytoplasm
 - (D) Golgi

25. Dark reaction requires :
- (A) ATP and NADPH
 - (B) Light directly
 - (C) Oxygen
 - (D) Heat
26. Enzyme responsible for CO₂ fixation is :
- (A) Rubisco
 - (B) Amylase
 - (C) Lipase
 - (D) Protease
27. Ethylene is :
- (A) Liquid
 - (B) Gas
 - (C) Solid
 - (D) Protein
28. Fermentation occurs in :
- (A) Anaerobic condition
 - (B) Aerobic condition
 - (C) Both (A) and (B)
 - (D) None of the above
29. Ferredoxin is involved in :
- (A) Light reaction
 - (B) Dark reaction
 - (C) Glycolysis
 - (D) Krebs cycle
30. First stable product of C₃ cycle is :
- (A) Glucose
 - (B) PGA
 - (C) Pyruvate
 - (D) RuBP
31. Flavonoids belong to :
- (A) Alkaloids
 - (B) Terpenes
 - (C) Phenolics
 - (D) Proteins
32. Gibberellins promote :
- (A) Seed dormancy
 - (B) Stem elongation
 - (C) Leaf fall
 - (D) Senescence

33. Glutathione acts as :
- (A) Enzyme
 - (B) Hormone
 - (C) Antioxidant
 - (D) Pigment
34. Glycolysis occurs in :
- (A) Mitochondria
 - (B) Cytoplasm
 - (C) Chloroplast
 - (D) Nucleus
35. Glycolysis yields net ATP :
- (A) 2
 - (B) 4
 - (C) 6
 - (D) 8
36. Glyoxylate cycle helps in :
- (A) Fat to sugar conversion
 - (B) Sugar to fat
 - (C) Protein synthesis
 - (D) DNA synthesis
37. Glyoxylate cycle occurs in :
- (A) Glyoxysomes
 - (B) Chloroplast
 - (C) Mitochondria
 - (D) Nucleus
38. Guard cells contain :
- (A) Chloroplast
 - (B) Nucleus
 - (C) Vacuole
 - (D) All of the above
39. Hill reaction produces :
- (A) O₂
 - (B) CO₂
 - (C) ATP
 - (D) NADH
40. Krebs cycle occurs in :
- (A) Cytoplasm
 - (B) Mitochondria
 - (C) Chloroplast
 - (D) Nucleus
41. Light reaction occurs in :
- (A) Stroma
 - (B) Cytoplasm
 - (C) Thylakoid membrane
 - (D) Nucleus

42. Lignin is formed from :
- (A) Proteins
 - (B) Phenolics
 - (C) Lipids
 - (D) Sugars
43. Lipids in plants are stored in :
- (A) Vacuole
 - (B) Ribosomes
 - (C) Nucleus
 - (D) Oil bodies
44. Malate is important in :
- (A) C₃ cycle
 - (B) C₄ pathway
 - (C) Glycolysis
 - (D) ETC
45. Membrane fluidity depends on :
- (A) Lipids
 - (B) Proteins
 - (C) Temperature
 - (D) All of the above
46. NADH is produced in :
- (A) Glycolysis
 - (B) Krebs cycle
 - (C) Both (A) and (B)
 - (D) None of the above
47. NADPH is produced in :
- (A) Light reaction
 - (B) Dark reaction
 - (C) Glycolysis
 - (D) Krebs cycle
48. Nitrate reductase reduces :
- (A) NO_3^- to NO_2^-
 - (B) NO_2^- to NH_3
 - (C) NH_3 to NO_3^-
 - (D) N_2 to NH_3
49. Nitrite reductase produces :
- (A) NO_3^-
 - (B) NH_3
 - (C) NO_2^-
 - (D) N_2
50. Nitrogen fixation is done by :
- (A) Plants
 - (B) Viruses
 - (C) Fungi
 - (D) Bacteria

51. Nitrogenase enzyme requires :
- (A) Oxygen
 - (B) Anaerobic conditions
 - (C) Light
 - (D) Heat
52. Non-cyclic photophosphorylation produces :
- (A) ATP
 - (B) NADPH
 - (C) O₂
 - (D) All of the above
53. Osmosis involves movement of :
- (A) Solute
 - (B) Solvent
 - (C) Gas
 - (D) Protein
54. Oxygen is released from :
- (A) CO₂
 - (B) Water
 - (C) Glucose
 - (D) ATP
55. PEP carboxylase is found in :
- (A) C₃ plants
 - (B) C₄ plants
 - (C) CAM plants
 - (D) Both (B) and (C)
56. Peroxidase removes :
- (A) O₂
 - (B) H₂O₂
 - (C) CO₂
 - (D) ATP
57. Phenolics are synthesized from :
- (A) Shikimic acid pathway
 - (B) Glycolysis
 - (C) Krebs cycle
 - (D) ETC
58. Phospholipids are part of :
- (A) Cell wall
 - (B) Membrane
 - (C) Cytoplasm
 - (D) Nucleus

59. Photooxidation damages :
- (A) Chlorophyll
 - (B) DNA
 - (C) Proteins
 - (D) Lipids
60. Photorespiration consumes :
- (A) CO₂
 - (B) O₂
 - (C) ATP
 - (D) NADPH
61. Photorespiration occurs in :
- (A) C₄ plants only
 - (B) CAM plants only
 - (C) C₃ plants
 - (D) All plants equally
62. The symplastic movement of the minerals from one cell to another takes place through :
- (A) Cell wall
 - (B) Vacuole
 - (C) Intercellular spaces
 - (D) Plasmodesmata
63. Photosystem I absorbs at :
- (A) 680 nm
 - (B) 700 nm
 - (C) 600 nm
 - (D) 550 nm
64. Photosystem II absorbs at :
- (A) 680 nm
 - (B) 700 nm
 - (C) 500 nm
 - (D) 400 nm
65. Phytochrome senses :
- (A) Blue light
 - (B) Red light
 - (C) UV
 - (D) Infrared
66. Plant respiration releases :
- (A) O₂
 - (B) CO₂
 - (C) N₂
 - (D) H₂

67. Plastoquinone functions in :

- (A) Electron transport
- (B) DNA synthesis
- (C) Protein synthesis
- (D) Lipid metabolism

68. Proton gradient drives :

- (A) ATP synthesis
- (B) NADPH formation
- (C) CO₂ fixation
- (D) Glycolysis

69. Pyruvate is formed in :

- (A) Krebs cycle
- (B) Glycolysis
- (C) ETC
- (D) Calvin cycle

70. Reactive oxygen species include :

- (A) O₂⁻
- (B) H₂O₂
- (C) OH•
- (D) All of the above

71. RuBisCO also acts as :

- (A) Oxygenase
- (B) Kinase
- (C) Isomerase
- (D) Transferase

72. RuBisCO is located in :

- (A) Thylakoid
- (B) Stroma
- (C) Cytoplasm
- (D) Nucleus

73. RuBP is :

- (A) 3-carbon compound
- (B) 5-carbon compound
- (C) 6-carbon compound
- (D) 4-carbon compound

74. Seed germination uses :

- (A) Lipids
- (B) Proteins
- (C) Stored reserves
- (D) All of the above

75. Signal transduction involves :
- (A) Receptors
 - (B) Secondary messengers
 - (C) Enzymes
 - (D) All of the above
76. Starch is stored in :
- (A) Chloroplast
 - (B) Amyloplast
 - (C) Nucleus
 - (D) Vacuole
77. Stomatal opening is regulated by :
- (A) Potassium ions
 - (B) Sodium ions
 - (C) Calcium only
 - (D) Chlorine
78. Sucrose is transported through :
- (A) Xylem
 - (B) Phloem
 - (C) Cortex
 - (D) Epidermis
79. Sucrose synthesis occurs in :
- (A) Cytosol
 - (B) Chloroplast
 - (C) Mitochondria
 - (D) Nucleus
80. Terpenoids are derived from :
- (A) Amino acids
 - (B) Isoprene units
 - (C) Sugars
 - (D) Lipids
81. The primary photosynthetic pigment is :
- (A) Chlorophyll a
 - (B) Chlorophyll b
 - (C) Carotene
 - (D) Xanthophyll
82. Turgor pressure is important for :
- (A) Growth
 - (B) Rigidity
 - (C) Stomatal movement
 - (D) All of the above
83. Water potential affects :
- (A) Transpiration
 - (B) Absorption
 - (C) Movement
 - (D) All of the above
84. Water splitting occurs in :
- (A) PSI
 - (B) PSII
 - (C) Calvin cycle
 - (D) ETC

85. The plant hormone responsible for cell elongation is :
- (A) Cytokinin
 - (B) Auxin
 - (C) Ethylene
 - (D) Abscisic acid
86. Which hormone promotes lateral bud growth and delays senescence ?
- (A) Auxin
 - (B) Gibberellin
 - (C) Cytokinin
 - (D) Ethylene
87. Which plant hormone is known as the “stress hormone” ?
- (A) Auxin
 - (B) Gibberellin
 - (C) Abscisic acid
 - (D) Cytokinin
88. Fruit ripening is mainly controlled by :
- (A) Cytokinin
 - (B) Ethylene
 - (C) Auxin
 - (D) Gibberellin
89. Diffusion is movement of molecules from :
- (A) Low to high concentration
 - (B) High to low concentration
 - (C) Equal concentration
 - (D) Random movement
90. Water potential is represented by :
- (A) Ψ_w
 - (B) Ψ_s
 - (C) Ψ_p
 - (D) Ψ_m
91. Imbibition involves absorption of :
- (A) Solute
 - (B) Water
 - (C) Gas
 - (D) Nutrients
92. Guttation occurs through :
- (A) Stomata
 - (B) Roots
 - (C) Lenticels
 - (D) Hydathodes

93. Transpiration pull is :
- (A) Root pressure
 - (B) Negative pressure
 - (C) Positive pressure
 - (D) Osmotic pressure
94. Florigen is :
- (A) Hormone
 - (B) Enzyme
 - (C) Flowering signal
 - (D) Protein
95. Vernalization promotes :
- (A) Growth
 - (B) Flowering
 - (C) Dormancy
 - (D) Senescence
96. Bundle sheath cells found in :
- (A) C₃ plants
 - (B) CAM plants
 - (C) C₄ plants
 - (D) All of the above
97. Enzyme nitrogenase requires :
- (A) O₂
 - (B) NO₂
 - (C) CO₂
 - (D) H₂
98. Essential elements are required for :
- (A) Growth
 - (B) Reproduction
 - (C) Metabolism
 - (D) All of the above
99. Nitrogen is absorbed as :
- (A) NH₄⁺ and NO₃⁻
 - (B) Reproduction
 - (C) Metabolism
 - (D) All of the above
100. Hydroponics is :
- (A) Soil culture
 - (B) Water culture
 - (C) Air culture
 - (D) Sand culture

(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।