Roll No. .....

Question Booklet Number

O. M. R. Serial No.

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
D

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. Nitrogen fixation is done by :

(A) Plants

(B) Viruses

(C) Fungi

(D) Bacteria

2. Nitrite reductase produces :

(A) NO_3^-

(B) NH_3

(C) NO_2^-

(D) N_2

3. 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

4. NADPH is produced in :

(A) Light reaction

(B) Dark reaction

(C) Glycolysis

(D) Krebs cycle

5. NADH is produced in :

(A) Glycolysis

(B) Krebs cycle

(C) Both (A) and (B)

(D) None of the above

6. Membrane fluidity depends on :

(A) Lipids

(B) Proteins

(C) Temperature

(D) All of the above

7. Malate is important in :

(A) C3 cycle

(B) C4 pathway

(C) Glycolysis

(D) ETC

8. Lipids in plants are stored in :

(A) Vacuole

(B) Ribosomes

(C) Nucleus

(D) Oil bodies

9. Lignin is formed from :

(A) Proteins

(B) Phenolics

(C) Lipids

(D) Sugars

10. Light reaction occurs in :

(A) Stroma

(B) Cytoplasm

(C) Thylakoid membrane

(D) Nucleus

11. Krebs cycle occurs in :

(A) Cytoplasm

(B) Mitochondria

(C) Chloroplast

(D) Nucleus

12. Hill reaction produces :

(A) O_2

(B) CO_2

(C) ATP

(D) NADH

13. Guard cells contain :

(A) Chloroplast

(B) Nucleus

(C) Vacuole

(D) All of the above

14. Glyoxylate cycle occurs in :

(A) Glyoxysomes

(B) Chloroplast

(C) Mitochondria

(D) Nucleus

15. Glyoxylate cycle helps in :

(A) Fat to sugar conversion

(B) Sugar to fat

(C) Protein synthesis

(D) DNA synthesis

16. Glycolysis yields net ATP :

(A) 2

(B) 4

(C) 6

(D) 8

17. Glycolysis occurs in :

(A) Mitochondria

(B) Cytoplasm

(C) Chloroplast

(D) Nucleus

18. Glutathione acts as :

(A) Enzyme

(B) Hormone

(C) Antioxidant

(D) Pigment

19. Gibberellins promote :

(A) Seed dormancy

(B) Stem elongation

(C) Leaf fall

(D) Senescence

20. Flavonoids belong to :

(A) Alkaloids

(B) Terpenes

(C) Phenolics

(D) Proteins

21. First stable product of C3 cycle is :

(A) Glucose

(B) PGA

(C) Pyruvate

(D) RuBP

22. Ferredoxin is involved in :

(A) Light reaction

(B) Dark reaction

(C) Glycolysis

(D) Krebs cycle

23. Fermentation occurs in :

(A) Anaerobic condition

(B) Aerobic condition

(C) Both (A) and (B)

(D) None of the above

24. Ethylene is :

(A) Liquid

(B) Gas

(C) Solid

(D) Protein

25. Enzyme responsible for CO_2 fixation is :

(A) Rubisco

(B) Amylase

(C) Lipase

(D) Protease

26. Dark reaction requires :

(A) ATP and NADPH

(B) Light directly

(C) Oxygen

(D) Heat

27. Dark reaction occurs in :

(A) Thylakoid

(B) Stroma

(C) Cytoplasm

(D) Golgi

28. Cytokinins promote :

(A) Cell division

(B) Aging

(C) Respiration

(D) Death

29. Cytochrome complex transfers :

(A) Electrons

(B) Protons

(C) Both (A) and (B)

(D) None of the above

30. Cyclic photophosphorylation produces :

(A) ATP only

(B) NADPH only

(C) Both (A) and (B)

(D) None of the above

31. CO_2 fixation occurs in :

(A) Light reaction

(B) ETC

(C) Glycolysis

(D) Calvin cycle

32. Chloroplast DNA is :

(A) Linear

(B) Circular

(C) Single-stranded

(D) Absent

33. Chlorophyll absorbs mainly :

(A) Green light

(B) Yellow light

(C) Red and blue light

(D) Infrared

34. Chemiosmotic theory was proposed by :

(A) Krebs

(B) Mitchell

(C) Calvin

(D) Hill

35. Catalase converts :

(A) H_2O_2 to $H_2O + O_2$

(B) CO_2 to O_2

(C) ATP to ADP

(D) NADH to NAD^+

36. CAM plants open stomata at :

(A) Day

(B) Night

(C) Noon

(D) Evening

37. Calcium acts as :

(A) Secondary messenger

(B) Hormone

(C) Enzyme

(D) Pigment

38. C4 plants minimize :

(A) Photosynthesis

(B) Photorespiration

(C) Respiration

(D) Transpiration

39. Bundle sheath cells are prominent in :

(A) C3 plants

(B) CAM plants

(C) C4 plants

(D) All of the above

40. Beta-oxidation occurs in :

(A) Cytoplasm

(B) Peroxisome

(C) Nucleus

(D) Chloroplast

41. Auxin promotes :

(A) Cell elongation

(B) Cell death

(C) Respiration

(D) Photosynthesis

42. ATP synthesis occurs in :

(A) Mitochondria

(B) Chloroplast

(C) Both (A) and (B)

(D) None of the above

43. ATP synthase is located in :

(A) Thylakoid membrane

(B) Cytoplasm

(C) Nucleus

(D) Golgi

44. ATP is produced in :

(A) Dark reaction

(B) Light reaction

(C) Glycolysis

(D) Respiration only

45. ATP is generated in ETC by :

(A) Substrate-level phosphorylation

(B) Oxidative phosphorylation

(C) Photophosphorylation

(D) Hydrolysis

46. Antioxidants in plants include :

(A) Vitamin C

(B) Vitamin E

(C) Carotenoids

(D) All of the above

47. Ammonia assimilation occurs via :

(A) GS-GOGAT pathway

(B) Glycolysis

(C) Krebs cycle

(D) ETC

48. Alkaloids are :

(A) Primary metabolites

(B) Secondary metabolites

(C) Proteins

(D) Lipids

49. Accessory pigments include :

(A) Chlorophyll a

(B) Lipids

(C) Proteins

(D) Carotenoids

50. Abscisic acid causes :

(A) Growth

(B) Dormancy

(C) Division

(D) Germination

51. Hydroponics is :

(A) Soil culture

(B) Water culture

(C) Air culture

(D) Sand culture

52. Nitrogen is absorbed as :

(A) NH_4^+ and NO_3^-

(B) Reproduction

(C) Metabolism

(D) All of the above

53. Essential elements are required for :

(A) Growth

(B) Reproduction

(C) Metabolism

(D) All of the above

54. Enzyme nitrogenase requires :

(A) O_2

(B) NO_2

(C) CO_2

(D) H_2

55. Bundle sheath cells found in :

(A) C3 plants

(B) CAM plants

(C) C4 plants

(D) All of the above

56. Vernalization promotes :

(A) Growth

(B) Flowering

(C) Dormancy

(D) Senescence

57. Florigen is :

(A) Hormone

(B) Enzyme

(C) Flowering signal

(D) Protein

58. Transpiration pull is :

(A) Root pressure

(B) Negative pressure

(C) Positive pressure

(D) Osmotic pressure

59. Guttation occurs through :

(A) Stomata

(B) Roots

(C) Lenticels

(D) Hydathodes

60. Imbibition involves absorption of :

(A) Solute

(B) Water

(C) Gas

(D) Nutrients

61. Water potential is represented by :

(A) Ψ_w

(B) Ψ_s

(C) Ψ_p

(D) Ψ_m

62. Diffusion is movement of molecules from :

(A) Low to high concentration

(B) High to low concentration

(C) Equal concentration

(D) Random movement

63. Fruit ripening is mainly controlled by :

(A) Cytokinin

(B) Ethylene

(C) Auxin

(D) Gibberellin

64. Which plant hormone is known as the "stress hormone" ?

(A) Auxin

(B) Gibberellin

(C) Abscisic acid

(D) Cytokinin

65. Which hormone promotes lateral bud growth and delays senescence ?

(A) Auxin

(B) Gibberellin

(C) Cytokinin

(D) Ethylene

66. The plant hormone responsible for cell elongation is :

(A) Cytokinin

(B) Auxin

(C) Ethylene

(D) Abscisic acid

67. Water splitting occurs in :

(A) PSI

(B) PSII

(C) Calvin cycle

(D) ETC

68. Water potential affects :

(A) Transpiration

(B) Absorption

(C) Movement

(D) All of the above

69. Turgor pressure is important for :

(A) Growth

(B) Rigidity

(C) Stomatal movement

(D) All of the above

70. The primary photosynthetic pigment is :

(A) Chlorophyll a

(B) Chlorophyll b

(C) Carotene

(D) Xanthophyll

71. Terpenoids are derived from :

(A) Amino acids

(B) Isoprene units

(C) Sugars

(D) Lipids

72. Sucrose synthesis occurs in :

(A) Cytosol

(B) Chloroplast

(C) Mitochondria

(D) Nucleus

73. Sucrose is transported through :

(A) Xylem

(B) Phloem

(C) Cortex

(D) Epidermis

74. Stomatal opening is regulated by :

(A) Potassium ions

(B) Sodium ions

(C) Calcium only

(D) Chlorine

75. Starch is stored in :

(A) Chloroplast

(B) Amyloplast

(C) Nucleus

(D) Vacuole

76. Signal transduction involves :

(A) Receptors

(B) Secondary messengers

(C) Enzymes

(D) All of the above

77. Seed germination uses :

(A) Lipids

(B) Proteins

(C) Stored reserves

(D) All of the above

78. RuBP is :

(A) 3-carbon compound

(B) 5-carbon compound

(C) 6-carbon compound

(D) 4-carbon compound

79. RuBisCO is located in :

(A) Thylakoid

(B) Stroma

(C) Cytoplasm

(D) Nucleus

80. RuBisCO also acts as :

(A) Oxygenase

(B) Kinase

(C) Isomerase

(D) Transferase

81. Reactive oxygen species include :

(A) O_2^-

(B) H_2O_2

(C) OH•

(D) All of the above

82. Pyruvate is formed in :

(A) Krebs cycle

(B) Glycolysis

(C) ETC

(D) Calvin cycle

83. Proton gradient drives :

(A) ATP synthesis

(B) NADPH formation

(C) CO_2 fixation

(D) Glycolysis

84. Plastoquinone functions in :

(A) Electron transport

(B) DNA synthesis

(C) Protein synthesis

(D) Lipid metabolism

85. Plant respiration releases :

(A) O_2

(B) CO_2

(C) N_2

(D) H_2

86. Phytochrome senses :

(A) Blue light

(B) Red light

(C) UV

(D) Infrared

87. Photosystem II absorbs at :

(A) 680 nm

(B) 700 nm

(C) 500 nm

(D) 400 nm

88. Photosystem I absorbs at :

(A) 680 nm

(B) 700 nm

(C) 600 nm

(D) 550 nm

89. The symplastic movement of the minerals from one cell to another takes place through :

(A) Cell wall

(B) Vacuole

(C) Intercellular spaces

(D) Plasmodesmata

90. Photorespiration occurs in :

(A) C4 plants only

(B) CAM plants only

(C) C3 plants

(D) All plants equally

91. Photorespiration consumes :

(A) CO_2

(B) O_2

(C) ATP

(D) NADPH

92. Photooxidation damages :

(A) Chlorophyll

(B) DNA

(C) Proteins

(D) Lipids

93. Phospholipids are part of :

(A) Cell wall

(B) Membrane

(C) Cytoplasm

(D) Nucleus

94. Phenolics are synthesized from :

(A) Shikimic acid pathway

(B) Glycolysis

(C) Krebs cycle

(D) ETC

95. Peroxidase removes :

(A) O_2

(B) H_2O_2

(C) CO_2

(D) ATP

96. PEP carboxylase is found in :

(A) C3 plants

(B) C4 plants

(C) CAM plants

(D) Both (B) and (C)

97. Oxygen is released from :

(A) CO_2

(B) Water

(C) Glucose

(D) ATP

98. Osmosis involves movement of :

(A) Solute

(B) Solvent

(C) Gas

(D) Protein

99. Non-cyclic photophosphorylation produces :

(A) ATP

(B) NADPH

(C) O_2

(D) All of the above

100. Nitrogenase enzyme requires :

(A) Oxygen

(B) Anaerobic conditions

(C) Light

(D) Heat

(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।