Roll No.----------

प्रश्नपुस्तिका क्रमांक
Question Booklet No.

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

K-1365

B.Sc. (Biotech.) (Second Semester) Examination, 2025-26

(NEP)

(BBT2002) BACK PAPER

PLANT PHYSIOLOGY

Paper Code
BBT2002

(To be filled in the OMR Sheet)

प्रश्नपुस्तिका सीरीज
Question 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.

(Remaining instructions on the last page)

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 हो या उसमें किसी अन्य प्रकार की कमी हो, तो उसे तुरन्त बदल लें।

(शेष निर्देश अन्तिम पृष्ठ पर)

1. Casparian strips occur in:

   (A) Epidermis

   (B) Cortex

   (C) Endodermis

   (D) Pericycle

2. Which of the following is a living component of xylem?

   (A) Vessel

   (B) Tracheid

   (C) Xylem fiber

   (D) Xylem parenchyma

3. Phloem transports:

   (A) Water

   (B) Minerals

   (C) Food

   (D) Oxygen

4. Xylem transports:

   (A) Food

   (B) Water and minerals

   (C) Hormones

   (D) Proteins

5. Sclerenchyma cells are characterized by:

   (A) Thin walls

   (B) Living protoplasm

   (C) Thick lignified walls

   (D) Large vacuole

6. Which of the following is a simple permanent tissue?

(A) Xylem

(B) Phloem

(C) Collenchyma

(D) Vascular bundle

7. The quiescent centre is present in:

(A) Shoot apex

(B) Cambium

(C) Leaf apex

(D) Root apex

8. Root apical meristem is protected by:

(A) Epidermis

(B) Root cap

(C) Cortex

(D) Endodermis

9. Shoot apical meristem is responsible for:

(A) Primary growth

(B) Secondary growth

(C) Lateral growth

(D) Root formation

10. Leghemoglobin in root nodules helps in:

(A) Nitrogen transport

(B) Nitrate reduction

(C) Ammonia synthesis

(D) Oxygen regulation

11. The energy requirement for nitrogen fixation is in the form of:

(A) NADH only

(B) ATP

(C) $FADH_Z$

(D) GTP

12. Glutamine synthetase converts:

(A) Ammonia to nitrate

(B) Glutamine to glutamate

(C) Glutamate to glutamine

(D) Nitrite to ammonia

13. Ammonium assimilation in plants mainly occurs through:

(A) GS-GOGAT pathway

(B) Urea cycle

(C) Glycolysis

(D) TCA cycle

14. Nitrate reductase converts nitrate into:

(A) Nitrite

(B) Ammonia

(C) Nitrogen

(D) Amino acid

15. Which of the following is a free-living nitrogen-fixing bacterium?

(A) Rhizobium

(B) Frankia

(C) Azotobacter

(D) Bradyrhizobium

16. The symbiotic nitrogen-fixing bacteria in leguminous plants belong to:

(A) Azotobacter

(B) Rhizobium

(C) Clostridium

(D) Anabaena

17. The enzyme responsible for biological nitrogen fixation is:

(A) Nitrate reductase

(B) Nitrite reductase

(C) Nitrogenase

(D) Glutamine synthetase

18. Photorespiration mainly occurs in :

(A) C4 plants

(B) CAM plants

(C) C3 plants

(D) Algae only

19. Photorespiration occurs due to :

(A) High CO_2 concentration

(B) High ATP

(C) Low temperature

(D) High O_2 concentration

20. CAM plants open stomata during :

(A) Day

(B) Night

(C) Afternoon

(D) Morning

21. The enzyme responsible for CO_2 fixation in Calvin cycle is :

(A) Rubisco

(B) ATP synthase

(C) RuBP kinase

(D) Hexokinase

22. The first stable product of Calvin cycle in C3 plants is :

(A) Oxaloacetate

(B) Ribulose phosphate

(C) Glucose

(D) 3-phosphoglycerate

23. The Calvin cycle occurs in

(A) Thylakoid membrane

(B) Grana

(C) Stroma

(D) Outer membrane

24. Non-cyclic photophosphorylation produces :

(A) ATP only

(B) NADPH only

(C) ATP and NADPH

(D) Glucose

25. ATP formation during photosynthesis is called :

(A) Oxidative phosphorylation

(B) Reductive phosphorylation

(C) Substrate level phosphorylation

(D) Photophosphorylation

26. Water splitting occurs in :

(A) Photosystem I

(B) Photosystem II

(C) Both Photosystem I and II

(D) Calvin cycle

27. The reaction center chlorophyll of Photosystem II is :

(A) P600

(B) P700

(C) P750

(D) P680

28. The two photosystems involved in photosynthesis are :

(A) PS I and PS II

(B) PS I and PS III

(C) PS II and PS III

(D) PS III and PS IV

29. Carotenoids mainly function in :

(A) Photoprotection

(B) Carbon fixation

(C) ATP synthesis

(D) Water splitting

30. Chlorophyll a shows maximum absorption in :

(A) Green and yellow region

(B) Blue and red region

(C) Yellow and orange region

(D) Infrared region

31. The primary photosynthetic pigment in plants is :

(A) Chlorophyll b

(B) Carotene

(C) Chlorophyll a

(D) Xanthophyll

32. Vernalization promotes :

(A) Flowering

(B) Dormancy

(C) Senescence

(D) Abscission

33. Vernalization is :

(A) Water treatment

(B) Heat treatment

(C) Light treatment

(D) Cold treatment to induce flowering

34. Long day plants flower when :

(A) Day length is short

(B) Day length is long

(C) Temperature high

(D) Water available

35. Photoperiodism is response to :

(A) Temperature

(B) Water

(C) Light duration

(D) Nutrients

36. Water absorption during germination is called :

(A) Imbibition

(B) Respiration

(C) Transpiration

(D) Diffusion

37. Seed dormancy is :

(A) Active growth

(B) Temporary growth arrest

(C) Death

(D) Germination

38. Ethylene is synthesized in :

(A) Young tissues

(B) Leaves only

(C) Roots only

(D) Ripening fruits

39. ABA helps in -

(A) Stomatal opening

(B) Flowering

(C) Stomatal closure

(D) Fruit ripening

40. ABA promotes :

(A) Seed germination

(B) Stem elongation

(C) Cell division

(D) Seed dormancy

41. Cytokinins promote :

(A) Apical dominance

(B) Lateral bud growth

(C) Leaf fall

(D) Dormancy

42. Natural cytokinin is :

(A) IAA

(B) ABA

(C) Zeatin

(D) Ethylene

43. Cytokinins delay :

(A) Germination

(B) Senescence

(C) Flowering

(D) Dormancy

44. Gibberellins were first discovered in :

(A) Rice plant disease

(B) Wheat plant

(C) Maize plant

(D) Tobacco plant

45. Gibberellins promote :

(A) Stem elongation

(B) Root inhibition

(C) Leaf fall

(D) Senescence

46. Auxins are mainly synthesized in :

(A) Roots

(B) Shoot apex

(C) Hydathodes

(D) Seeds

47. Auxins promote :

(A) Lateral bud growth

(B) Seed dormancy

(C) Leaf fall

(D) Apical dominance

48. Natural auxin is :

(A) IAA

(B) GA3

(C) ABA

(D) Zeatin

49. Growth curve in plants is generally :

(A) Sigmoid

(B) Linear

(C) Circular

(D) Exponential

50. Plant growth is defined as :

(A) Cell signaling

(B) Irreversible increase in size and mass

(C) Cell metabolism

(D) Cell death

51. The organelles involved in photorespiration are chloroplast, peroxisome, and…….

(A) Mitochondria

(B) Nucleus

(C) Golgi apparatus

(D) Ribosomes

52. Pick the correct statement:

(A) Legumes do not fix nitrogen

(B) Legumes fix nitrogen independent of bacteria

(C) Legumes fix nitrogen through bacteria in their roots

(D) Legumes fix nitrogen through bacteria in their leaves

53. Leghaemoglobin is present in the root nodules of legumes. What is the function of leghaemoglobin?

(A) Oxygen removal

(B) Inhibition of nitrogenase activity

(C) Expression of *nif* gene

(D) Nodule differentiation

54. The Calvin cycle is present in:

(A) Only C3 plants

(B) C4 and CAM plants only

(C) All photosynthetic plants

(D) None of the above

55. Which plant is a typical CAM plant?

(A) Maize

(B) Spinach

(C) Barley

(D) Cactus

56. The adaptive advantage of CAM metabolism is:

(A) High temperature resistance

(B) Low CO_2 uptake

(C) Faster growth

(D) Water conservation

57. CAM plants fix CO_2 at:

(A) Dawn

(B) Night

(C) Midday

(D) Evening

58. C4 plants reduce photorespiration by:

(A) Using more water

(B) Increasing temperature

(C) Spatial separation of CO_2 fixation and Calvin cycle

(D) Night-time fixation

59. Which of the following is a C4 plant?

(A) Wheat

(B) Rice

(C) Sugarcane

(D) Tomato

60. The primary CO_2 fixing enzyme in C4 plants is:

(A) Rubisco

(B) PEP carboxylase

(C) Malate dehydrogenase

(D) Fumarase

61. In C4 plants, initial CO_2 fixation occurs in:

(A) Bundle sheath cells

(B) Guard cells

(C) Mesophyll cells

(D) Stomatal cavity

62. Which product is NOT formed in the light reactions?

(A) ATP

(B) NADPH

(C) O_2

(D) Glucose

63. The enzyme responsible for carbon fixation is:

(A) $NADP^+$ reductase

(B) ATP synthase

(C) Rubisco

(D) PEP carboxylase

64. Oxygen is released during photosynthesis from the:

(A) CO_2 molecule

(B) Chlorophyll

(C) Water

(D) NADPH

65. The light-dependent reactions occur in the:

(A) Stroma

(B) Cytosol

(C) Thylakoid membrane

(D) Inner chloroplast membrane

66. A short-day plant flowers when:

(A) Night is longer than a critical period

(B) Night is interrupted

(C) Day length is longer than a critical period

(D) Day length is constant

67. Photoperiodism refers to:

(A) Growth due to light intensity

(B) Temperature response

(C) Nutrient uptake in light

(D) Developmental response to light duration

68. Bidirectional movement of food occurs in:

(A) Xylem

(B) Cortex

(C) Phloem

(D) Endodermis

69. Loading of sugars into phloem requires:

(A) ATP

(B) Light

(C) Water

(D) Oxygen only

70. Translocation of food occurs from:

(A) Sink to source

(B) Source to sink

(C) Root to leaves only

(D) Stem to leaves

71. The main sugar transported in plants is:

(A) Glucose

(B) Fructose

(C) Sucrose

(D) Maltose

72. Food transport in plants occurs through:

(A) Xylem

(B) Epidermis

(C) Cortex

(D) Phloem

73. Active absorption of minerals requires:

(A) ATP

(B) Light

(C) CO_2

(D) Oxygen only

74. Mineral nutrients are absorbed mainly through:

(A) Leaves

(B) Roots

(C) Stem

(D) Flowers

75. Phosphorus deficiency leads to:

(A) Purple coloration of leaves

(B) Yellow leaves

(C) Leaf fall

(D) Stem breakage

76. Magnesium is a component of:

(A) Cell wall

(B) Chlorophyll

(C) Protein

(D) DNA

77. Nitrogen deficiency causes:

(A) Chlorosis of older leaves

(B) Necrosis

(C) Wilting

(D) Leaf curling

78. Which of the following is a micronutrient?

(A) Potassium

(B) Magnesium

(C) Iron

(D) Calcium

79. Which of the following is a macronutrient?

(A) Zinc

(B) Iron

(C) Nitrogen

(D) Copper

80. A nutrient is considered essential if:

(A) Plant cannot complete life cycle without it

(B) It increases growth

(C) It is present in soil

(D) It is absorbed by roots

81. Transpiration pull helps in:

(A) Food transport

(B) Cell division

(C) Respiration

(D) Water transport

82. Potassium ions play role in:

(A) Translocation

(B) Respiration

(C) Photosynthesis

(D) Stomatal movement

83. Opening of stomata occurs due to:

(A) Loss of turgor in guard cells

(B) Increase in turgor pressure

(C) Plasmolysis

(D) Cell shrinkage

84. Guard cells regulate:

(A) Photosynthesis

(B) Stomatal opening and closing

(C) Respiration

(D) Water absorption

85. Loss of water in the form of vapor from plants is called:

(A) Diffusion

(B) Respiration

(C) Transpiration

(D) Guttation

86. Guttation occurs mainly during:

(A) Daytime

(B) Evening

(C) Afternoon

(D) Night or early morning

87. Guttation occurs through:

(A) Stomata

(B) Hydathodes

(C) Lenticels

(D) Cuticle

88. Example of imbibition is:

(A) Seed germination

(B) Transpiration

(C) Photosynthesis

(D) Respiration

89. A hypotonic solution causes plant cells to:

(A) Shrink

(B) Die

(C) Burst

(D) Become turgid

90. Osmosis occurs through:

(A) Cell wall

(B) Semi-permeable membrane

(C) Cytoplasm

(D) Vacuole

91. Osmosis involves movement of:

(A) Solute molecules

(B) Water molecules

(C) Proteins

(D) Minerals

92. Diffusion is the movement of molecules from:

(A) High concentration to low concentration

(B) Low concentration to high concentration

(C) Equal concentration

(D) Active transport

93. Water is essential for photosynthesis because it:

(A) Produces glucose

(B) Forms starch

(C) Produces ATP directly

(D) Provides electrons

94. Bulliform cells are present in:

(A) Dicot leaf

(B) Monocot leaf

(C) Stem

(D) Root

95. Palisade parenchyma is present in:

(A) Lower epidermis

(B) Upper epidermis

(C) Mesophyll

(D) Cortex

96. Isobilateral leaves are found in:

(A) Dicots

(B) Pteridophytes

(C) Bryophytes

(D) Monocots

97. Dorsiventral leaf is typical of:

(A) Monocots

(B) Dicots

(C) Gymnosperms

(D) Mosses

98. Growth rings are formed due to:

(A) Seasonal variation

(B) Mineral deficiency

(C) Water shortage

(D) Sunlight variation

99. Secondary growth is caused by:

(A) Apical meristem

(B) Intercalary meristem

(C) Lateral meristem

(D) Root cap

100. The vascular bundles in dicot stem are:

(A) Open

(B) Closed

(C) Scattered

(D) Radial

******

Rough Work / रफ कार्य

4. Four alternative answers are mentioned for each question as – A, B, C & D in the question 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 एक 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, उत्तर 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।