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

प्रश्नपुस्तिका क्रमांक
Question Booklet No.

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

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

(NEP)

(BH100202T)

PLANT PHYSIOLOGY

K-1362

Paper Code
BH100202T

(To be filled in the OMR Sheet)

प्रश्नपुस्तिका सीरीज
Question 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.

(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. The "Tunica-Corpus" theory of shoot apical organization was proposed by:

   (A) Hanstem

   (B) Schmidt

   (C) Nageli

   (D) Haberlandt

2. The movement of water through a semipermeable membrane from high to low concentration is:

   (A) Diffusion

   (B) Imbibition

   (C) Osmosis

   (D) Translocation

3. "Interveinal chlorosis" in older leaves is a primary deficiency symptom of:

   (A) Magnesium

   (B) Nitrogen

   (C) Iron

   (D) Calcium

4. The primary CO_2 acceptor in C_3 plants (Calvin Cycle) is:

   (A) PEP (Phosphoenolpyruvate)

   (B) RuBP (Ribulose 1,5-bisphosphate)

   (C) OAA (Oxaloacetic acid)

   (D) PGA

5. A sigmoid growth curve consists of which phases?

   (A) Lag, Log, and Stationary

   (B) Lag and Log only

   (C) Log and Declining

   (D) Linear growth only

6. Cytokinins are primarily responsible for:

(A) Cell elongation

(B) Cell division

(C) Fruit ripening

(D) Seed dormancy

7. Who is often referred to as the "Father of Indian Plant Anatomy"?

(A) P. Maheshwari

(B) K.A. Chowdhury

(C) Birbal Sahni

(D) M.O.P. Iyengar

8. The "Vrikshayurveda," an ancient Indian text covering plant life and anatomy, was written by:

(A) Charaka

(B) Sushruta

(C) Surapala

(D) Varahamihira

9. The quiescent center in the root meristem is characterized by:

(A) Rapid cell division

(B) High metabolic activity

(C) Low mitotic activity

(D) Absence of cells

10. A leaf having stomata only on the lower surface is called:

(A) Amphistomatic

(B) Epistomatic

(C) Hypostomatic

(D) Astomatic

11. The pressure exerted by the cell wall against the turgid protoplast is:

(A) Turgor Pressure

(B) Wall Pressure

(C) Suction Pressure

(D) Osmotic Pressure

12. Which of the following is a "Beneficial Element" rather than a standard essential nutrient?

(A) Magnesium

(B) Phosphorus

(C) Silicon

(D) Iron

13. The "Carrier Concept" in mineral absorption suggests that:

(A) Ions move by simple diffusion

(B) Specific proteins transport ions across membranes

(C) Ions are carried by water currents

(D) Ions move through the cell wall only

14. The process of ATP synthesis during the light reaction is called:

(A) Oxidative phosphorylation

(B) Substrate-level phosphorylation

(C) Photophosphorylation

(D) Respiration

15. Which enzyme catalyzes the first step of nitrogen fixation in the soil?

(A) Glutamine synthetase

(B) Dinitrogenase

(C) Nitrate reductase

(D) Catalase

16. Seed dormancy caused by a hard seed coat can be broken by:

(A) Scarification

(B) Stratification

(C) Vernalization

(D) Photoperiodism

17. The "Richmond-Lang Effect" (delay of senescence) is caused by:

(A) Auxins

(B) Cytokinins

(C) Abscisic Acid

(D) Ethylene

18. According to the Histogen Theory, which layer gives rise to the epidermis?

(A) Plerome

(B) Periblem

(C) Dermatogen

(D) Calyptrogen

19. Sclerenchyma cells are generally:

(A) Living and thin-walled

(B) Dead and lignified

(C) Living and rich in pectin

(D) Involved in photosynthesis

20. In a root, the xylem and phloem are arranged on different radii. This arrangement is called:

(A) Conjoint

(B) Collateral

(C) Radial

(D) Concentric

21. The path of water movement through cell walls and intercellular spaces is known as:

(A) Symplast

(B) Apoplast

(C) Vacuolar pathway

(D) Transmembrane pathway

22. Which of the following prevents the backflow of water from the xylem to the root cortex?

(A) Epidermis

(B) Pericycle

(C) Casparian strips (Endodermis)

(D) Hypodermis

23. The "Mass Flow Hypothesis" for food transport was proposed by:

(A) Dixon and Jolly

(B) Munch

(C) Curtis

(D) Godlewski

24. "Little leaf" disease in plants is typically caused by a deficiency of:

(A) Copper

(B) Zinc

(C) Manganese

(D) Iron

25. Which of the following is a "C4" plant?

(A) Rice

(B) Wheat

(C) Maize

(D) Potato

26. Cyclic photophosphorylation involves only:

(A) Photosystem II

(B) Photosystem I

(C) Both PS I and PS II

(D) Cytochrome b6 only

27. The site of perception of the light stimulus for photoperiodism is the:

(A) Stem apex

(B) Flower bud

(C) Leaf

(D) Root tip

28. "Avena Curvature Test" is a bioassay for:

(A) Gibberellins

(B) Auxins

(C) Cytokinins

(D) Ethylene

29. In a dicot root, the innermost layer of the cortex that contains starch grains is the:

(A) Exodermis

(B) Endodermis

(C) Pericycle

(D) Hypodermis

30. The presence of "Tyloses" (balloon-like outgrowths) is a characteristic of:

(A) Phloem

(B) Sapwood

(C) Heartwood

(D) Cortex

31. "Inherent life force" or "Prana" in plants was discussed in ancient Indian texts. Which scientist scientifically demonstrated that plants respond to stimuli like animals?

(A) P. Maheshwari

(B) J.C. Bose

(C) K.C. Mehta

(D) M.S. Swaminathan

32. The Diffusion Pressure Deficit (DPD) of a fully turgid cell is:

(A) Equal to Osmotic Pressure

(B) Equal to Turgor Pressure

(C) Zero

(D) Infinite

33. Which theory explains the mechanism of food transport through "Pressure Flow"?

(A) Dixon-Jolly Theory

(B) Munch Hypothesis

(C) Godlewski Theory

(D) Relay Pump Theory

34. Which element plays a vital role in the translocation of sugars in plants?

(A) Boron

(B) Manganese

(C) Molybdenum

(D) Chlorin

35. In the C_4 pathway, the CO_2 fixation occurs in which cells?

(A) Mesophyll cells

(B) Bundle sheath cells

(C) Epidermal cells

(D) Both (A) and (B)

36. The compensation point for CO_2 in C_4 plants is:

(A) 0-10 ppm

(B) 50—100 ppm

(C) 100—200 ppm

(D) Same as C_3 plants

37. The first stable product of the Nitrogen fixation process in the nodules is:

(A) Nitrate

(B) Nitrite

(C) Ammonia

(D) Glutamate

38. Which enzyme is responsible for the conversion of Nitrite to Ammonium?

(A) Nitrate Reductase

(B) Nitrite Reductase

(C) Nitrogenase

(D) Transaminase

39. The precursor of Indole-3-Acetic Acid (IAA/Auxin) is the amino acid:

(A) Methionine

(B) Tryptophan

(C) Lysine

(D) Proline

40. The term "Vernalization" was coined by:

(A) T.D. Lysenko

(B) Garner and Allard

(C) Went

(D) Miller

41. Plant that requires a dark period shorter than a critical length to flower is a:

(A) Short Day Plant (SDP)

(B) Long Day Plant (LDP)

(C) Day Neutral Plant (DNP)

(D) Short-Long Day Plant

42. Which gas is used to commercially ripen green bananas?

(A) Carbon dioxide

(B) Methane

(C) Ethylene

(D) Nitrogen

43. The transition from primary growth to secondary growth is initiated by:

(A) Apical meristem

(B) Interfascicular cambium

(C) Cork cambium only

(D) Protoderm

44. The value of Osmotic Potential is always:

(A) Positive

(B) Negative

(C) Zero

(D) Variable

45. The phenomenon of "Imbibition" involves:

(A) Adsorption of water by hydrophilic colloids

(B) Movement of water through a membrane

(C) Energy expenditure by the cell

(D) Only living cells

46. Which nutrient is a structural component of the middle lamella in plant cells?

(A) Magnesium

(B) Calcium

(C) Potassium

(D) Phosphorus

47. The "Cytochrome Pump Theory" of active ion transport was proposed by:

(A) Lundegardh

(B) Bennet-Clark

(C) Munch

(D) Hanes

48. RuBisCO can act as both a carboxylase and an:

(A) Reductase

(B) Oxygenase

(C) Isomerase

(D) Hydrolase

49. How many molecules of ATP are required to produce one molecule of glucose in the C_3 cycle?

(A) 12

(B) 18

(C) 30

(D) 38

50. The primary enzyme for CO_2 fixation in CAM plants during the night is:

(A) RuBisCO

(B) PEP Carboxylase

(C) Pyruvate Kinase

(D) Carbonic Anhydrase

51. "Photoperiodism" was first discovered in which plant?

(A) Maryland Mammoth Tobacco

(B) Arabidopsis

(C) Rice

(D) Pea

52. Which hormone prevents the "pre-harvest fruit drop" in apples and tomatoes?

(A) Abscisic acid

(B) Auxins (NAA)

(C) Ethylene

(D) Gibberellins

53. In the process of secondary growth, the "Heartwood" is physiologically:

(A) Active and conducting

(B) Inactive and non-conducting

(C) Primary in origin

(D) Located outside the sapwood

54. Which of the following is a "Short Day Plant"?

(A) Xanthium

(B) Spinach

(C) Wheat

(D) Sugar beet

55. The enzyme Nitrogenase is highly sensitive to:

(A) Nitrogen

(B) Oxygen

(C) Hydrogen

(D) Carbon dioxide

56. Cyclic photophosphorylation involves:

(A) Both PS I and PS II

(B) Only PS II

(C) Only PS I

(D) Neither PS I nor PS II

57. Photolysis of water takes place in:

(A) PSI

(B) PSII

(C) Both

(D) Stroma

58. Emerson used which wavelengths?

(A) Red and blue

(B) Blue and green

(C) Red and far-red

(D) Green and yellow

59. Which hormone delays senescence?

(A) Auxin

(B) Cytokinin

(C) Ethylene

(D) ABA

60. ABA is also called:

(A) Growth hormone

(B) Stress hormone

(C) Ripening hormone

(D) Flowering hormone

61. Apical dominance is controlled by:

(A) Cytokinin

(B) Auxin

(C) Ethylene

(D) ABA

62. Deficiency of which element causes “Whiptail of Cauliflower”?

(A) Copper

(B) Zinc

(C) Boron

(D) Molybdenum

63. The site of light-dependent reactions in the chioroplast is the:

(A) Stroma

(B) Cell wall

(C) Outer membrane

(D) Thylakoid membrane

64. Kranz anatomy is a characteristic feature of:

(A) C3 plants

(B) C4 plants

(C) CAM plants

(D) Hydrophytes

65. Wilting of plants is caused by:

(A) Auxin

(B) Cytokinin

(C) ABA

(D) Gibberellin

66. Which factor helps break seed dormancy?

(A) High ABA

(B) Scarification

(C) Lack of oxygen

(D) Low temperature only

67. First structure to emerge during germination:

(A) Plumule

(B) Cotyledon

(C) Radicle

(D) Endosperm

68. Enzyme important in germination:

(A) Amylase

(B) Lipase

(C) Protease

(D) All of these

69. Outermost layer of root:

(A) Cortex

(B) Epidermis

(C) Endodermis

(D) Pericycle

70. Casparian strips are found in:

(A) Cortex

(B) Pericycle

(C) Endodermis

(D) Xylem

71. Vascular bundles in dicot stem are:

(A) Scattered

(B) In a ring

(C) Absent

(D) Parallel

72. Secondary growth is absent in:

(A) Dicot stem

(B) Dicot root

(C) Monocot stem

(D) Gymnosperms

73. Photorespiration occurs in:

(A) Only chloroplast

(B) Only mitochondria

(C) Chloroplast, peroxisome, and mitochondria

(D) Cytoplasm only

74. Which condition favors photorespiration?

(A) High CO_2, low O_2

(B) Low CO_2, high O_2

(C) High CO_2, high O_2

(D) Low CO_2, low O_2

75. Photosystem I reaction center is:

(A) P680

(B) P700

(C) P600

(D) P720

76. Order of electron flow in non-cyclic pathway:

(A) PS I $\rightarrow$ PS II

(B) PS II $\rightarrow$ PS I

(C) PS I $\rightarrow$ PS I

(D) PS II $\rightarrow$ PS II

77. Electron acceptor of PSI:

(A) NADP

(B) Oxygen

(C) Water

(D) CO_2

78. The drop in photosynthetic efficiency beyond 680 nm is called:

(A) Red drop

(B) Blue shift

(C) Quantum drop

(D) Photo drop

79. During germination, stored food is mobilized by:

(A) DNA

(B) Enzymes

(C) Hormones only

(D) Oxygen

80. Interfascicular cambium originates from:

(A) Cortex

(B) Pith

(C) Medullary rays

(D) Epidermis

81. Glycolate pathway is another name for:

(A) Calvin cycle

(B) Photorespiration

(C) Krebs cycle

(D) Glycolysis

82. Primary electron acceptor of PS II is:

(A) Plastocyanin

(B) $NADP^+$

(C) Ferredoxin

(D) Pheophytin

83. Reaction center chlorophyll is:

(A) Accessory pigment

(B) Special chlorophyll a molecule

(C) Protein

(D) Enzyme

84. Parenchyma cells are:

(A) Dead and lignified

(B) Hollow

(C) Thick-walled and dead

(D) Living and thin-walled

85. Fibres and sclereids are types of:

(A) Parenchyma

(B) Collenchyma

(C) Sclerenchyma

(D) Xylem

86. Which xylem element is living?

(A) Tracheids

(B) Vessels

(C) Xylem fibres

(D) Xylem parenchyma

87. Which of the following is absent in phloem of angiosperms?

(A) Sieve tubes

(B) Companion cells

(C) Albuminous cells

(D) Phloem parenchyma

88. Which of the following is a lateral meristem responsible for secondary growth?

(A) Intercalary meristem

(B) Vascular cambium

(C) Procambium

(D) Protoderm

89. In a dorsiventral (dicot) leaf, the palisade parenchyma is located on which side?

(A) Abaxial

(B) Adaxial

(C) Both sides

(D) Lateral sides

90. The movement of water through a semipermeable membrane from high to low concentration is:

(A) Diffusion

(B) Imbibition

(C) Osmosis

(D) Translocation

91. When a plant cell is placed in a hypertonic solution, it undergoes:

(A) Turgidity

(B) Plasmolysis

(C) De-plasmolysis

(D) Haemolysis

92. Guttation occurs through specialized structures called:

(A) Stomata

(B) Lenticels

(C) Hydathodes

(D) Pneumatophores

93. The "Triple Response" in seedlings is a characteristic effect of which hormone?

(A) Ethylene

(B) Auxin

(C) Gibberellin

(D) Abscisic acid

94. Heartwood differs from sapwood in:

(A) Being lighter in color

(B) Having active tracheary elements

(C) Presence of tyloses and resins

(D) Being located at the periphery

95. According to the "K^+ Ion Exchange Theory," stomata open when:

(A) K^+ ions move out of guard cells

(B) K^+ ions move into guard cells

(C) Guard cells lose water

(D) Abscisic acid levels increase

96. Short Day Plants (SDP) flower only when:

(A) Day length is longer than critical dark period

(B) Night length is longer than critical dark period

(C) Temperature is very low

(D) Light intensity is very high

97. Which of the following is responsible for the formation of the periderm (bark)?

(A) Vascular cambium

(B) Cork cambium (Phellogen)

(C) Intercalary meristem

(D) Dermatogen

98. Passive absorption of minerals depends on:

(A) Concentration gradient

(B) Expenditure of ATP

(C) Metabolic inhibitors

(D) Temperature only

99. Deficiency of which micronutrient causes "Die-back of Citrus"?

(A) Zinc

(B) Copper

(C) Boron

(D) Iron

100. During the Light Reaction, the flow of electrons from Water to PS II, then to PS I and finally to $NADP^+$ is called:

(A) Z-Scheme

(B) Kreb's Cycle

(C) Calvin Cycle

(D) EMP Pathway

******

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 Ⓐ ● Ⓒ Ⓓ

Q. 2 Ⓐ Ⓑ ● Ⓓ

Q. 3 Ⓐ ● Ⓒ Ⓓ

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 Ⓐ ● Ⓒ Ⓓ

प्रश्न 2 Ⓐ Ⓑ ● Ⓓ

प्रश्न 3 Ⓐ ● Ⓒ Ⓓ

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।