

Roll No.-----

प्रश्नपुस्तिका क्रमांक
Question Booklet No.

O.M.R. Serial No.

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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

B

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

(Remaining instructions on the last page)

(शेष निर्देश अन्तिम पृष्ठ पर)

1. “Photoperiodism” was first discovered in which plant?
 - (A) Maryland Mammoth Tobacco
 - (B) Arabidopsis
 - (C) Rice
 - (D) Pea
2. Which hormone prevents the “pre-harvest fruit drop” in apples and tomatoes?
 - (A) Abscisic acid
 - (B) Auxins (NAA)
 - (C) Ethylene
 - (D) Gibberellins
3. 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
4. Which of the following is a “Short Day Plant”?
 - (A) Xanthium
 - (B) Spinach
 - (C) Wheat
 - (D) Sugar beet
5. The enzyme Nitrogenase is highly sensitive to:
 - (A) Nitrogen
 - (B) Oxygen
 - (C) Hydrogen
 - (D) Carbon dioxide

6. 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
7. Photolysis of water takes place in:
- (A) PSI
 - (B) PSII
 - (C) Both
 - (D) Stroma
8. Emerson used which wavelengths?
- (A) Red and blue
 - (B) Blue and green
 - (C) Red and far-red
 - (D) Green and yellow
9. Which hormone delays senescence?
- (A) Auxin
 - (B) Cytokinin
 - (C) Ethylene
 - (D) ABA
10. ABA is also called:
- (A) Growth hormone
 - (B) Stress hormone
 - (C) Ripening hormone
 - (D) Flowering hormone

11. Apical dominance is controlled by:
- (A) Cytokinin
 - (B) Auxin
 - (C) Ethylene
 - (D) ABA
12. Deficiency of which element causes “Whiptail of Cauliflower”?
- (A) Copper
 - (B) Zinc
 - (C) Boron
 - (D) Molybdenum
13. The site of light-dependent reactions in the chloroplast is the:
- (A) Stroma
 - (B) Cell wall
 - (C) Outer membrane
 - (D) Thylakoid membrane
14. Kranz anatomy is a characteristic feature of:
- (A) C3 plants
 - (B) C4 plants
 - (C) CAM plants
 - (D) Hydrophytes
15. Wilting of plants is caused by:
- (A) Auxin
 - (B) Cytokinin
 - (C) ABA
 - (D) Gibberellin

16. Which factor helps break seed dormancy?
- (A) High ABA
 - (B) Scarification
 - (C) Lack of oxygen
 - (D) Low temperature only
17. First structure to emerge during germination:
- (A) Plumule
 - (B) Cotyledon
 - (C) Radicle
 - (D) Endosperm
18. Enzyme important in germination:
- (A) Amylase
 - (B) Lipase
 - (C) Protease
 - (D) All of these
19. Outermost layer of root:
- (A) Cortex
 - (B) Epidermis
 - (C) Endodermis
 - (D) Pericycle
20. Casparian strips are found in:
- (A) Cortex
 - (B) Pericycle
 - (C) Endodermis
 - (D) Xylem

21. Vascular bundles in dicot stem are:
- (A) Scattered
 - (B) In a ring
 - (C) Absent
 - (D) Parallel
22. Secondary growth is absent in:
- (A) Dicot stem
 - (B) Dicot root
 - (C) Monocot stem
 - (D) Gymnosperms
23. Photorespiration occurs in:
- (A) Only chloroplast
 - (B) Only mitochondria
 - (C) Chloroplast, peroxisome, and mitochondria
 - (D) Cytoplasm only
24. Which condition favors photorespiration?
- (A) High CO₂, low O₂
 - (B) Low CO₂, high O₂
 - (C) High CO₂, high O₂
 - (D) Low CO₂, low O₂
25. Photosystem I reaction center is:
- (A) P680
 - (B) P700
 - (C) P600
 - (D) P720

26. Order of electron flow in non-cyclic pathway:
- (A) PS I → PS II
 - (B) PS II → PS I
 - (C) PS I → PS I
 - (D) PS II → PS II
27. Electron acceptor of PSI:
- (A) NADP
 - (B) Oxygen
 - (C) Water
 - (D) CO₂
28. The drop in photosynthetic efficiency beyond 680 nm is called:
- (A) Red drop
 - (B) Blue shift
 - (C) Quantum drop
 - (D) Photo drop
29. During germination, stored food is mobilized by:
- (A) DNA
 - (B) Enzymes
 - (C) Hormones only
 - (D) Oxygen
30. Interfascicular cambium originates from:
- (A) Cortex
 - (B) Pith
 - (C) Medullary rays
 - (D) Epidermis

31. Glycolate pathway is another name for:
- (A) Calvin cycle
 - (B) Photorespiration
 - (C) Krebs cycle
 - (D) Glycolysis
32. Primary electron acceptor of PS II is:
- (A) Plastocyanin
 - (B) NADP⁺
 - (C) Ferredoxin
 - (D) Pheophytin
33. Reaction center chlorophyll is:
- (A) Accessory pigment
 - (B) Special chlorophyll a molecule
 - (C) Protein
 - (D) Enzyme
34. Parenchyma cells are:
- (A) Dead and lignified
 - (B) Hollow
 - (C) Thick-walled and dead
 - (D) Living and thin-walled
35. Fibres and sclereids are types of:
- (A) Parenchyma
 - (B) Collenchyma
 - (C) Sclerenchyma
 - (D) Xylem

36. Which xylem element is living?
- (A) Tracheids
 - (B) Vessels
 - (C) Xylem fibres
 - (D) Xylem parenchyma
37. Which of the following is absent in phloem of angiosperms?
- (A) Sieve tubes
 - (B) Companion cells
 - (C) Albuminous cells
 - (D) Phloem parenchyma
38. Which of the following is a lateral meristem responsible for secondary growth?
- (A) Intercalary meristem
 - (B) Vascular cambium
 - (C) Procambium
 - (D) Protoderm
39. In a dorsiventral (dicot) leaf, the palisade parenchyma is located on which side?
- (A) Abaxial
 - (B) Adaxial
 - (C) Both sides
 - (D) Lateral sides
40. The movement of water through a semipermeable membrane from high to low concentration is:
- (A) Diffusion
 - (B) Imbibition
 - (C) Osmosis
 - (D) Translocation

41. When a plant cell is placed in a hypertonic solution, it undergoes:
- (A) Turgidity
 - (B) Plasmolysis
 - (C) De-plasmolysis
 - (D) Haemolysis
42. Guttation occurs through specialized structures called:
- (A) Stomata
 - (B) Lenticels
 - (C) Hydathodes
 - (D) Pneumatophores
43. The “Triple Response” in seedlings is a characteristic effect of which hormone?
- (A) Ethylene
 - (B) Auxin
 - (C) Gibberellin
 - (D) Abscisic acid
44. 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
45. 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

46. 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
47. 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
48. Passive absorption of minerals depends on:
- (A) Concentration gradient
 - (B) Expenditure of ATP
 - (C) Metabolic inhibitors
 - (D) Temperature only
49. Deficiency of which micronutrient causes “Die-back of Citrus”?
- (A) Zinc
 - (B) Copper
 - (C) Boron
 - (D) Iron
50. 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) Krebs’s Cycle
 - (C) Calvin Cycle
 - (D) EMP Pathway

51. The “Tunica-Corpus” theory of shoot apical organization was proposed by:
- (A) Hanstem
 - (B) Schmidt
 - (C) Nageli
 - (D) Haberlandt
52. The movement of water through a semipermeable membrane from high to low concentration is:
- (A) Diffusion
 - (B) Imbibition
 - (C) Osmosis
 - (D) Translocation
53. “Interveinal chlorosis” in older leaves is a primary deficiency symptom of:
- (A) Magnesium
 - (B) Nitrogen
 - (C) Iron
 - (D) Calcium
54. The primary CO₂ acceptor in C₃ plants (Calvin Cycle) is:
- (A) PEP (Phosphoenolpyruvate)
 - (B) RuBP (Ribulose 1,5-bisphosphate)
 - (C) OAA (Oxaloacetic acid)
 - (D) PGA
55. 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

56. Cytokinins are primarily responsible for:
- (A) Cell elongation
 - (B) Cell division
 - (C) Fruit ripening
 - (D) Seed dormancy
57. 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
58. The “Vrikshayurveda,” an ancient Indian text covering plant life and anatomy, was written by:
- (A) Charaka
 - (B) Sushruta
 - (C) Surapala
 - (D) Varahamihira
59. 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
60. A leaf having stomata only on the lower surface is called:
- (A) Amphistomatic
 - (B) Epistomatic
 - (C) Hypostomatic
 - (D) Astomatic

61. The pressure exerted by the cell wall against the turgid protoplast is:
- (A) Turgor Pressure
 - (B) Wall Pressure
 - (C) Suction Pressure
 - (D) Osmotic Pressure
62. Which of the following is a “Beneficial Element” rather than a standard essential nutrient?
- (A) Magnesium
 - (B) Phosphorus
 - (C) Silicon
 - (D) Iron
63. 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
64. The process of ATP synthesis during the light reaction is called:
- (A) Oxidative phosphorylation
 - (B) Substrate-level phosphorylation
 - (C) Photophosphorylation
 - (D) Respiration
65. Which enzyme catalyzes the first step of nitrogen fixation in the soil?
- (A) Glutamine synthetase
 - (B) Dinitrogenase
 - (C) Nitrate reductase
 - (D) Catalase

66. Seed dormancy caused by a hard seed coat can be broken by:
- (A) Scarification
 - (B) Stratification
 - (C) Vernalization
 - (D) Photoperiodism
67. The “Richmond-Lang Effect” (delay of senescence) is caused by:
- (A) Auxins
 - (B) Cytokinins
 - (C) Abscisic Acid
 - (D) Ethylene
68. According to the Histogen Theory, which layer gives rise to the epidermis?
- (A) Plerome
 - (B) Periblem
 - (C) Dermatogen
 - (D) Calyptrogen
69. Sclerenchyma cells are generally:
- (A) Living and thin-walled
 - (B) Dead and lignified
 - (C) Living and rich in pectin
 - (D) Involved in photosynthesis
70. In a root, the xylem and phloem are arranged on different radii. This arrangement is called:
- (A) Conjoint
 - (B) Collateral
 - (C) Radial
 - (D) Concentric

71. The path of water movement through cell walls and intercellular spaces is known as:
- (A) Symplast
 - (B) Apoplast
 - (C) Vacuolar pathway
 - (D) Transmembrane pathway
72. 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
73. The “Mass Flow Hypothesis” for food transport was proposed by:
- (A) Dixon and Jolly
 - (B) Munch
 - (C) Curtis
 - (D) Godlewski
74. “Little leaf” disease in plants is typically caused by a deficiency of:
- (A) Copper
 - (B) Zinc
 - (C) Manganese
 - (D) Iron
75. Which of the following is a “C4” plant?
- (A) Rice
 - (B) Wheat
 - (C) Maize
 - (D) Potato

76. Cyclic photophosphorylation involves only:
- (A) Photosystem II
 - (B) Photosystem I
 - (C) Both PS I and PS II
 - (D) Cytochrome b6 only
77. The site of perception of the light stimulus for photoperiodism is the:
- (A) Stem apex
 - (B) Flower bud
 - (C) Leaf
 - (D) Root tip
78. “Avena Curvature Test” is a bioassay for:
- (A) Gibberellins
 - (B) Auxins
 - (C) Cytokinins
 - (D) Ethylene
79. In a dicot root, the innermost layer of the cortex that contains starch grains is the:
- (A) Exodermis
 - (B) Endodermis
 - (C) Pericycle
 - (D) Hypodermis
80. The presence of “Tyloses” (balloon-like outgrowths) is a characteristic of:
- (A) Phloem
 - (B) Sapwood
 - (C) Heartwood
 - (D) Cortex

81. “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
82. 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
83. 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
84. Which element plays a vital role in the translocation of sugars in plants?
- (A) Boron
 - (B) Manganese
 - (C) Molybdenum
 - (D) Chlorin
85. In the C₄ pathway, the CO₂ fixation occurs in which cells?
- (A) Mesophyll cells
 - (B) Bundle sheath cells
 - (C) Epidermal cells
 - (D) Both (A) and (B)

86. The compensation point for CO₂ in C₄ plants is:
- (A) 0-10 ppm
 - (B) 50—100 ppm
 - (C) 100—200 ppm
 - (D) Same as C₃ plants
87. The first stable product of the Nitrogen fixation process in the nodules is:
- (A) Nitrate
 - (B) Nitrite
 - (C) Ammonia
 - (D) Glutamate
88. Which enzyme is responsible for the conversion of Nitrite to Ammonium?
- (A) Nitrate Reductase
 - (B) Nitrite Reductase
 - (C) Nitrogenase
 - (D) Transaminase
89. The precursor of Indole-3-Acetic Acid (IAA/Auxin) is the amino acid:
- (A) Methionine
 - (B) Tryptophan
 - (C) Lysine
 - (D) Proline
90. The term “Vernalization” was coined by:
- (A) T.D. Lysenko
 - (B) Garner and Allard
 - (C) Went
 - (D) Miller

91. 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
92. Which gas is used to commercially ripen green bananas?
- (A) Carbon dioxide
 - (B) Methane
 - (C) Ethylene
 - (D) Nitrogen
93. The transition from primary growth to secondary growth is initiated by:
- (A) Apical meristem
 - (B) Interfascicular cambium
 - (C) Cork cambium only
 - (D) Protoderm
94. The value of Osmotic Potential is always:
- (A) Positive
 - (B) Negative
 - (C) Zero
 - (D) Variable
95. 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

96. Which nutrient is a structural component of the middle lamella in plant cells?
- (A) Magnesium
 - (B) Calcium
 - (C) Potassium
 - (D) Phosphorus
97. The “Cytochrome Pump Theory” of active ion transport was proposed by:
- (A) Lundegardh
 - (B) Bennet-Clark
 - (C) Munch
 - (D) Hanes
98. RuBisCO can act as both a carboxylase and an:
- (A) Reductase
 - (B) Oxygenase
 - (C) Isomerase
 - (D) Hydrolase
99. How many molecules of ATP are required to produce one molecule of glucose in the C₃ cycle?
- (A) 12
 - (B) 18
 - (C) 30
 - (D) 38
100. The primary enzyme for CO₂ fixation in CAM plants during the night is:
- (A) RuBisCO
 - (B) PEP Carboxylase
 - (C) Pyruvate Kinase
 - (D) Carbonic Anhydrase

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 छॉटना 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 सिरिज की दूसरी प्रश्न-पुस्तिका प्राप्त कर लें।