Roll No. .....

Question Booklet Number

O. M. R. Serial No.

B. Sc. (Biotechnology) (Second Semester)

EXAMINATION, July, 2022

PLANT ANATOMY & PHYSIOLOGY

Paper Code				
BBT	2	0	0	2

Questions Booklet Series
B

Time : 1:30 Hours] [*Maximum Marks : 100*

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 any 75 questions in the OMR Answer-Sheet provided and not in the question booklet. If more than 75 questions are attempted by student, then the first attempted 75 questions will be considered for evaluation. 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 किन्हीं 75 प्रश्नों को केवल दी गई OMR आन्सर-शीट पर ही हल करना है, प्रश्न-पुस्तिका पर नहीं। यदि छात्र द्वारा 75 से अधिक प्रश्नों को हल किया जाता है तो प्रारम्भिक हल किये हुए 75 उत्तरों को ही मूल्यांकन हेतु सम्मिलित किया जाएगा। 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. Process of selective transmission of a liquid through semi-permeable membrane is called :

(A) Diffusion

(B) Osmosis

(C) Plasmolysis

(D) Transpiration

2. If a cell shrinks when placing in a solution of sugar, the solution is :

(A) Hypotonic

(B) Hypertonic

(C) Isotonic

(D) None of the above

3. Water potential of pure water is :

(A) 1

(B) 2

(C) 3

(D) Zero

4. Osmotic pressure is due to :

(A) Solute

(B) Water

(C) Cell membrane

(D) Air

5. Along with plasmolysis which of the following decreases in the cell ?

(A) Osmotic pressure

(B) Diffusion pressure deficit

(C) Turgor pressure

(D) None of the above

6. In plants the translocation of organic solutes take place through :

(A) Xylem

(B) Phloem

(C) Both Xylem and phloem

(D) Cortex

7. Water rises in the stem due to :

(A) Cohesion and transpiration pull

(B) Turgor pressure

(C) Osmotic pressure

(D) Water potential

8. Ascent of sap in woody stern occurs mainly due to :

(A) Transpiration pull

(B) Capillary action

(C) Molecular adhesion

(D) All of the above

9. Symplast include all the following, except :

(A) Cytoplasm

(B) Cell wall

(C) Cell membrane

(D) Plasmodesmata

10. Passive absorption of water from the soil by the root is mainly effected by :

(A) Typical tissue organisation

(B) Respiratory activity of root

(C) Tension on cell sap due to transpiration

(D) None of the above

11. Continuity of water column in xylem is maintained due to :

(A) Presence of inorganic ions

(B) Cohesive property of water

(C) Evaporation power of water

(D) Osmosis

12. During rainy season wooden doors generally swell up due to :

(A) Osmosis

(B) Imbibition

(C) Plasmolysis

(D) Both (A) and (B)

13. The most important factor affecting transpiration is :

(A) Light

(B) Temperature

(C) Wind

(D) Atmospheric humidity

14. Increase in CO_2 concentration around leaf results in :

(A) Rapid opening of stomata

(B) Partial closure of stomata

(C) Complete closure of stomata

(D) No effect on stomatal opening

15. Which of the following side of wall of guard cells is thick ?

(A) Outer

(B) Inner

(C) Sidewall

(D) Both (A) and (B)

16. Xylem is associated with translocation of :

(A) Water and minerals

(B) Organic food

(C) Only water

(D) All of the above

17. Which condition favours guttation ?

(A) High water absorption

(B) High transpiration

(C) Low transpiration

(D) Both (A) and (C)

18. The hydathodes are related with :

(A) Transpiration

(B) Guttation

(C) Evaporation

(D) None of the above

19. Diffusion is not dependent on :

(A) Concentration gradient

(B) Membrane permeability

(C) A living system

(D) Temperature

20. Select the correct statement :

(A) Facilitated transport and active transport are sensitive to inhibitors.

(B) Facilitated transport do not require ATP energy.

(C) Both facilitated transport and active transport are highly selective.

(D) All of the above are correct.

21. Water molecules are unable to penetrate the endodermis because of :

(A) Presence of cellulosic casparian strip

(B) Presence of casparian strip made up of suberin

(C) Presence of lignin in the casparian strip

(D) All of the above

22. Transpiration is completely absent in :

(A) Xerophytes

(B) Mesophytes

(C) Submerged hydrophytes

(D) None of the above

23. Guttation is the result of :

(A) Root pressure

(B) Diffusion

(C) Transpiration

(D) Osmosis

24. Wilting of plants occurs when :

(A) Xylem is blocked.

(B) Epidermis is peeled off.

(C) Pith is removed.

(D) Phloem is blocked.

25. Water of guttation is :

(A) Pure water

(B) Water with dissolved salts

(C) Water with organic food

(D) All of the above

26. Photorespiration is favoured by :

(A) Low light intensity

(B) Low O_2 and high CO_2

(C) Low temperature

(D) High O_2 and low CO_2

27. In Chloroplasts, chlorophyll is present in the :

(A) Stroma

(B) Outer membrane

(C) Inner membrane

(D) Thylakoids

28. In C_3 plants, the first stable product of photosynthesis during the dark reaction is :

(A) Phosphoglyceraldehyde

(B) Malic acid

(C) Oxaloacetic acid

(D) 3-Phosphoglyceric acid

29. What does not occur in photorespiration ?

(A) Utilization of O_2

(B) Production of CO_2

(C) Synthesis of ATP

(D) All of the above

30. Which enzyme fixes atmospheric CO_2 in C_4 plants ?

(A) PEP carhoxylase

(B) RUBP oxygenase

(C) RUBP carboxylase

(D) All of the above

31. Chloroplast is present in bundle sheath cells of :

(A) C_3 plants

(B) C_4 plants

(C) CAM plants

(D) All of the above

32. CO_2 is accepted by RUBP in C_4 plants in :

(A) Mesophyll cells

(B) Bundle sheath cells

(C) Hypodermal cells

(D) Pericycle cells

33. Kranz anatomy of leaf is characteristic feature of which of the following ?

(A) C_4 plants

(B) C_3 plants

(C) Both C_4 and C_3 plants

(D) Algae

34. The process of Photophosphorylation take place in :

(A) Chloroplast

(B) Mitochondria

(C) Endoplasmic reticulum

(D) Cell wall

35. Which of the following pigments does not occur in chloroplast ?

(A) Carotene

(B) Xanthophyll

(C) Chlorophyll-b

(D) Anthocyanin

36. Factor affecting salt absorption is :

(A) Temperature

(B) pH

(C) Oxygen tension

(D) All of the above

37. In pigment system I, reaction center is :

(A) P-600

(B) P-680

(C) P-700

(D) P-720

38. Which of the following are the end product of thylakoid reactions ?

(A) ATP and O_2

(B) ATP and NADH

(C) NADH and O_2

(D) ATP and NADPH

39. Select the correct statement for light reaction of Photosynthesis :

(A) Photosystem I participate in both cyclic and non-cyclic photophosphorylation.

(B) Photosystem I and II participate in both cyclic and non-cyclic photophosphorylation.

(C) Plastoquinone and plastocyanine does not carry electrons between Photosystem I and II.

(D) Both (A) and (C) are correct.

40. Which mineral nutrients are called critical element ?

(A) N, P, K

(B) C, H, O

(C) N, S, Mg

(D) K, Ca, Fe

41. Which mineral elements are immobile within a plant ?

(A) Nitrogen and Potassium

(B) Phosphorus and Zinc

(C) Phosphorus and Magnesium

(D) Sulfur and Iron

42. In nitrification, ammonia is converted to :

(A) Nitrogen

(B) Nitrate

(C) Nitrite

(D) Amide

43. Denitrification releases :

(A) Nitrogen

(B) Oxygen and nitrogen

(C) Carbon dioxide

(D) Nitrogen and carbon monoxide

44. The enzyme nitrogenase is present in :

(A) only in some eukaryotes

(B) exclusively in prokaryotes

(C) in fungus

(D) in leguminous plants

45. Glutamate dehydrogenase is an important enzyme involved in :

(A) Calvin's cycle

(B) Nitrogen fixation

(C) Glycolysis

(D) Amino acid biosynthesis

46. Which of the following is not an anaerobic nitrogen fixing organism ?

(A) *Azotobacter*

(B) *Clostridium*

(C) *Rhodospirillum*

(D) None of the above

47. Nitrogen fixation is the conversion of :

(A) N_2 to N

(B) N_2 to NH_3

(C) N_2 to NO_3^-

(D) N_2 to Urea

48. Conversion of ammonia to nitrite and then to nitrates is called :

(A) Ammonification

(B) Denitrification

(C) Assimilation

(D) Nitrification

49. What is the first stable product of nitrogen fixation in the root nodules of leguminous plants ?

(A) Glutamate

(B) NO_3^-

(C) Ammonia

(D) NO_2^-

50. Nitrogen is absorbed by plants as :

(A) Nitrites

(B) Ammonium

(C) Nitrates

(D) All of the above

51. Which is a naturally occurring growth hormone ?

(A) Kinetin

(B) NAA

(C) Zeatin

(D) All of the above

52. Auxin is mainly produced by :

(A) Lateral meristem

(B) Root tip

(C) Shoot tip

(D) Root cambium

53. Gibberellins do not cause :

(A) Shortening of genetically tall plants

(B) Stimulation of shoot germination

(C) Promotion of partthenocarpy

(D) Bolting

54. Which growth hormone is responsible for apical dominance ?

(A) Auxin

(B) Cytokinin

(C) Gibberellins

(D) Ethylene

55. Dormancy of the seed is broken by :

(A) Auxin

(B) Gibberellins

(C) Ethylene

(D) Cytokinin

56. Typical growth curve in plant is :

(A) Linear

(B) Parabolic

(C) Sigmoidal

(D) All of the above

57. Root development is promoted by :

(A) Cytokinin

(B) Auxin

(C) Gibberellic acid

(D) Abscissic acid

58. Which of the following increases the tolerance of plants to various kind of stresses ?

(A) Ethylene

(B) NAA

(C) Abscissic acid

(D) None of the above

59. Removal of shoot tips usually results in the growth of lateral buds. It is related to the removal of effect of which plant hormone ?

(A) Ethylene

(B) Cytokinin

(C) Gibbereilic acid

(D) Auxin

60. Phytochrome is a photosensitive pigment involved in :

(A) Geotropism

(B) Phototropism

(C) Photoperiodism

(D) Photorespiration

61. In which of the following living species, phytochrome, the blue-green pigment is found ?

(A) Algae

(B) Fungi

(C) Flowering plants

(D) Vascular cryptograms

62. Which of the following hormone can replace vernalization ?

(A) Auxin

(B) Ethylene

(C) Cytokinins

(D) Gibberellins

63. Which of the following pigment involved in red-far red light interconversion ?

(A) Cytochrome

(B) Lycopene

(C) Phytochrome

(D) Xanthophyll

64. Which is the site for perception of light/dark duration ?

(A) Leaves

(B) Stem

(C) Roots

(D) Apical bud

65. **Statement (A) :** The critical length varies according to the plant.

Statement (B) : Day plants are those that are not dependent on crucial duration.

(A) Both the statements are true.

(B) Both the statements are false.

(C) Statement (A) is true but Statement (B) is false.

(D) Statement (B) is true but Statement (A) is false.

66. Short night plants are :

(A) Long day plants

(B) Short day plants

(C) Day neutral plants

(D) None of the above

67. If dark period is interrupted by red light in SDP, the plant will show :

(A) Early flowering

(B) Delay flowering

(C) Both possibilities

(D) No flowering

68. Gibberellins can facilitate seed germination due to their influence on :

(A) synthesis of abscissic acid

(B) rate of cell division

(C) production of hydrolyzing enzymes

(D) absorption of water through the hard seed coat

69. During the germination of seeds, the seed coat ruptures due to :

(A) massive imbibition of water

(B) differentiation of cotyledons

(C) a sudden increase in cell division

(D) massive glycolysis in cotyledons and endosperm

70. Seed dormancy allows the plants to :

(A) develop healthy seeds

(B) reduce viability

(C) overcome unfavourable climatic conditions

(D) prevent deterioration of seeds

71. Which of the following compounds can induce seed dormancy ?

(A) Potassium nitrate

(B) ABA

(C) Gibberellins

(D) Ethylene

72. Auxin inhibits the growth of :

(A) Apical bud

(B) Lateral auxillary buds

(C) Roots on stem cuttings

(D) None of the above

73. Which of the following is a gaseous hormone ?

(A) Auxin

(B) ABA

(C) Gibberellins

(D) Ethylene

74. Molybdenum is essential :

(A) For RuBisCO

(B) For nitrogenase enzyme

(C) For transaminase activity

(D) All of the above

75. Which of the following pairs is an example of nitrifying bacteria ?

(A) *Pesudomonas*

(B) *Nitrobacter* and *E. coli*

(C) *Nitrosomonas* and *Nitrococcus*

(D) *Pseudomonas* and *Klebsiella*

76. Xylem in stem is :

(A) Endarch

(B) Polyarch

(C) Exarch

(D) Mesarch

77. Cortex and Pith are not distinguish in :

(A) Monocot stem

(B) Monocot root

(C) Dicot stem

(D) Dicot root

78. Casparian strip is found in :

(A) Epidermis

(B) Endosperm

(C) Endodermis

(D) Pericycle

79. Secondary growth is the production of :

(A) New tissue from intercalary meristem

(B) New tissues from apical meristem

(C) New tissues from lateral meristem

(D) New dround tissue

80. Palisade parenchyma is absent in leaves of :

(A) Gram

(B) Sorgham

(C) Mustard

(D) Soybean

81. Ground tissue includes :

(A) All tissues external to endodermis

(B) All tissues except epidermis and vascular bundles

(C) Epidermis and cortex

(D) All tissues internal to endodermis

82. Closed vascular bundle lack :

(A) Xylem

(B) Cambium

(C) Phellogen

(D) Pith

83. Age of a tree can be estimated by :

(A) Diameter of its heartwood

(B) Its height and girth

(C) Diameter of stem

(D) Number of annual rings

84. Living element of xylem is :

(A) Tracheid

(B) Vessel

(C) Xylem parenchyma

(D) Xylem fibre

85. Lenticles are found in :

(A) All plants

(B) Woody trees

(C) Dicots

(D) All vascular plants

86. Function of collenchyma is :

(A) Photosynthesis

(B) Mechanical support

(C) Both (A) and (B)

(D) None of the above

87. The pith is scanty or altogether absent in :

(A) Dicot stem

(B) Dicot root

(C) Monocot stem

(D) Monocot root

88. The lateral roots in monocots are formed from :

(A) Endodermis

(B) Epidermis

(C) Pericycle

(D) Pith

89. Palisade parenchyma is found in :

(A) Stem

(B) Leaf

(C) Root

(D) All of the above

90. A isobilateral leaf have :

(A) Lack stomata

(B) Epidermis on both leaf surface

(C) Stomata in more or less equal number on both leaf surface

(D) Stomata on only lower surface of the leaf

91. Vascular bundles are closed in monocots as :

(A) presence of vascular cambium between xylem and phloem

(B) presence of xylem and phloem

(C) absence of vascular cambium

(D) xylem and phloem occur in separate bundles

92. Guard cell of stomata is :

(A) Kidney shape

(B) Convex in shape

(C) Irregular shape

(D) Cylindrical shape

93. The element found in chlorophyll :

(A) Cu

(B) Fe

(C) Mg

(D) Hg

94. Kerb's cycle takes place in :

(A) Chloroplast

(B) Ribosome

(C) Mitochondria

(D) Endoplasmic reticulum

95. Xylem consists of :

(A) Tracheids, fibers and parenchyma

(B) Tracheids, vessels and companion cells

(C) Tracheids, fibres, vessels and parenchyma

(D) Tracheids, companion cells, sieve cells and vessels

96. Guard cells differ from other epidermal cells in having :

(A) Secondary walls

(B) Chloroplast

(C) Large vacuoles

(D) Absence of mitochondria

97. Stomata of a plant open due to :

(A) Influx of potassium ion

(B) Efflux of potassium ion

(C) Root pressure

(D) Influx of chloride ion

98. Aerenchyma is helpful to plants by :

(A) Promoting photosynthesis

(B) Giving flexibility to plants

(C) Providing buoyancy to hydrophytes

(D) Giving mechanical strength to plants

99. Chlorenchyma is :

(A) Chlorophyll containing parenchyma

(B) Xylem parenchyma

(C) Mechanical tissue between two successive leaf primordial

(D) Phloem parenchyma

100. Select the correct statement for companion cells :

(A) Companion cell is a living cell.

(B) The companion cell and sieve tube elements are connected by pit fields present in their common longitudinal walls.

(C) It does not contain nucleus.

(D) Both (A) and (B) are correct.

4. Four alternative answers are mentioned for each question as—A, B, C & D in the booklet. The candidate has to choose the most correct/appropriate 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 ny 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 सबसे सही अथवा सबसे उपयुक्त 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।