Roll No. .....

Question Booklet Number

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

M. Sc. (Biochemistry) (Second Semester)

EXAMINATION, July, 2022

PLANT BIOCHEMISTRY

Paper Code				
BCH	2	0	0	3

Questions Booklet Series
C

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 60 questions. Examinee is required to answer any 50 questions in the OMR Answer-Sheet provided and not in the question booklet. If more than 50 questions are attempted by student, then the first attempted 50 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 60 प्रश्न हैं। परीक्षार्थी को किन्हीं 50 प्रश्नों को केवल दी गई OMR आन्सर-शीट पर ही हल करना है, प्रश्न-पुस्तिका पर नहीं। यदि छात्र द्वारा 50 से अधिक प्रश्नों को हल किया जाता है तो प्रारम्भिक हल किये हुए 50 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. Name the phenolic compound present in tea :

(A) Flavonoids

(B) Lignans

(C) Stilbene

(D) Neolignans

2. This major class of secondary metabolites is among the most pharmacologically active compounds (many have dramatic physiological effects on humans) examples are morphine, cocaine and caffeine :

(A) Alkaloids

(B) Terpenoids

(C) Terpenes

(D) Phenolics

3. Created through the mevalonic acid pathway; they are composed of isoprene units :

(A) Alkaloids

(B) Terpenoids

(C) Phenolics

(D) None of the above

4. Created through the shikimic acid pathway; it contains a hydroxyl group attached to an aromatic ring :

(A) Alkaloids

(B) Terpenoids

(C) Phenolics

(D) None of the above

5. They are modifications of amino acids; they are nitrogenous compounds that are bases :

(A) Alkaloids

(B) Terpenoids

(C) Phenolics

(D) None of the above

6. Nodulation and the development of an anaerobic environment to facilitate nitrogen fixation is characteristic of which genus :

(A) *Agrobacterium*

(B) *Escherichia*

(C) *Frankia*

(D) *Rhizobium*

7. The function of Leghaemoglobin in root nodules in rhizobium legume symbiosis is :

(A) to transport oxygen to the nodule formation.

(B) to transport nitrogen to the nodule bacterium.

(C) to protect the nodule bacterium.

(D) to protect the nitrogenase in the nodule bacterium.

8. Which of the following genera synthesizes Nod factors in order to activate a plant to allow development of an infection thread ?

(A) *Agrobacterium*

(B) *Escherichia*

(C) *Frankia*

(D) *Rhizobium*

9. In a young plant, the most active meristems are the :

(A) Apical meristems (at stem and root tips)

(B) Intercalary meristems

(C) Lateral meristems

(D) None of the above

10. The large vacuoles in plant cells are surrounded by a membrane is known as :

(A) apoplast

(B) symplast

(C) tonoplast

(D) protoplast

11. The osmotic driving force for water uptake by vacuole, which is required for plant cell enlargement is provided by :

(A) active solute accumulation

(B) gravitational pull

(C) hydrolytic enzymes

(D) protein bodies

12. Which one of the following is a nitrogen fixing species ?

(A) Cyanobacteria

(B) *Azotobacter*

(C) *Rhizobium*

(D) All of the above

13. Number of ATPs required to convert 1 molecule of nitrogen into 2 molecules of ammonia :

(A) 6

(B) 8

(C) 12

(D) 16

14. Nitrogen fixation is carried out by the enzyme :

(A) Ammonia synthetase

(B) Ammonia synthase

(C) Nitrogenase complex

(D) All of the above

15. Which of the following is incorrect regarding the 'quiescent zone' ?

(A) cell division proceeds very slowly or not at all.

(B) cells are capable of resuming meristematic activity.

(C) cells divide very rapidly.

(D) region is located in apical portion of root tip.

16. The identity of isolated cell components (organelles) is checked by which of the following ?

(A) density gradient centrifugation

(B) marker enzymes

(C) homogenization

(D) differential centrifugation

17. In a plant cell, the first wall laid down at the end of cell division is known as :

(A) Primary cell wall

(B) Secondary cell wall

(C) Phragmoplast

(D) Cellulose microfibrils

18. The channels in cell walls of plant cells that connect cytoplasms of adjacent cells are known as :

(A) Gap junctions

(B) Middle lamella

(C) Plasmotubule

(D) Plasmodesmata

19. Plant cell wall is made up of :

(A) Cellulose, hemicelluloses and pectin

(B) Cellulose only

(C) Cellulose, hemicelluloses and chitin

(D) Cellulose and chitin

20. Secondary wall increases by :

(A) Lignification

(B) Growth

(C) Saponification

(D) Calcification

21. Which pathway involves cell wall and intercellular spaces ?

(A) Phragmoplast pathway

(B) Protoplast pathway

(C) Symplast pathway

(D) Apoplast pathway

22. The rupture and fractionation do not usually occur in the water column in vessel/tracheids during ascent of sap because of :

(A) Cohesion and Adhesion

(B) Transpiration pull

(C) Lignified thick walls

(D) Weak gravitational pull

23. Root pressure occurs when there is :

(A) Less transpiration and less absorption

(B) More transpiration and more absorption

(C) Less transpiration and more absorption

(D) More transpiration and less absorption

24. The water potential of pure water is :

(A) less than zero

(B) more than zero, but less than one

(C) zero

(D) more than one

25. Transpiration and root pressure cause water to rise in plants by :

(A) pulling and pushing it, respectively

(B) pushing and pulling it, respectively

(C) pulling it upward

(D) pushing it upward

26. In the pathway for water uptake by roots, the apoplast pathway is blocked at the :

(A) cortex

(B) phloem

(C) lignified cell wall

(D) endodermis by casparian strips

27. Movement that is aided by cytoplasmic streaming and occurs from cell to cell through plasmodesmata is called :

(A) apoplast

(B) symplast

(C) active transport

(D) translocation

28. Which of the following statements is correct ?

(A) Unlike water, all minerals cannot be passively absorbed by roots.

(B) Most of minerals enter the root by active transport.

(C) Ions are absorbed from soil both by active and passive transport.

(D) All of the above

29. A pressure that is responsible for pushing up water to a small height in the stem is called :

(A) positive root pressure

(B) turgor pressure

(C) pressure gradient

(D) negative root pressure

30. The most powerful deterrent to insect feeding limonoid 'azadirachtin' isolated from neem tree belongs to which category of secondary metabolite ?

(A) Terpenes

(B) Phenolics

(C) Alkaloids

(D) None of the above

31. The number of photons needed for the evolution of one molecule of oxygen is :

(A) 8

(B) 2

(C) 12

(D) 18

32. During light phase of photosynthesis _____ is oxidized and _____ is reduced.

(A) CO_2 and Water

(B) Water and CO_2

(C) Water and NADP

(D) $NADPH_2$ and CO_2

33. During dark phase of photosynthesis _____ is oxidized and _____ is reduced.

(A) CO_2 and Water

(B) Water and CO_2

(C) Water and NADP

(D) $NADPH_2$ and CO_2

34. The visible product of photosynthesis is _____.

(A) glucose

(B) cellulose

(C) starch

(D) fructose

35. To produce 3 glucose molecules _____ ATP and _____ $NADPH_2$ molecules are required.

(A) 54, 36

(B) 54, 30

(C) 36, 60

(D) 18, 12

36. Dicot which follows C_4 pathway is _____.

(A) Wheat

(B) Amranthus

(C) Maize

(D) Mango

37. Which reaction is catalysed by the enzyme RuBisCO ?

(A) Carboxylation of ribulose bisphosphate (RuBP)

(B) Conversion of triose phosphate (TP) to ribulose phosphate (RuP)

(C) Oxidation of glycerate-3-phosphate (GP)

(D) Reduction of glycerate-3-phosphate (GP)

38. Emerson effect proves :

(A) concept of two photosystems in plant

(B) photophosphorylation

(C) photorespiration

(D) there are light and dark reaction in photosynthesis

39. Light reaction of photosynthesis results in formation of _____.

(A) O_2

(B) $NADPH + H^+$

(C) ATP

(D) All of the above

40. Temperature is very high but a plant is showing photosynthesis with normal rate, probably it would be :

(A) C_3 plant

(B) Mango plant

(C) Pea plant

(D) Sugarcane plant

41. The prerequisities of Calvin's cycle are :

(A) H_2O, CO_2, ATP

(B) ATP, H_2O, $NADPH_2$

(C) CO_2, ATP, $NADPH_2$

(D) $NADPH_2$, H_2O, CO_2

42. Which is sensitive to longer wavelength of light ?

(A) Photolysis

(B) PS-I

(C) PS-II

(D) Photophosphorylation

43. What name is given to an assembly of several hundred accessory pigment molecules around a molecule of chlorophyll-a ?

(A) Photolysis cluster

(B) Photoreaction centre

(C) Photosystem

(D) Photophosphorylation

44. In C_3 pathway, the first stable compound is :

(A) PGAL

(B) OAA

(C) PGA

(D) RUDP

45. In photosynthesis, the first step is :

(A) Photolysis of water

(B) Production of $NADPH_2$

(C) Photoexcitation of chlorophyll

(D) Synthesis of ATP

46. Which of the following is not a naturally occurring auxin ?

(A) Indole 3-acetic acid (IAA)

(B) Indole 3-butyric acid (IBA)

(C) Phenyl acetic acid (PAA)

(D) 2, 4-D

47. Name the stress hormone of the plant :

(A) Brassinosteroid

(B) Abscissic acid

(C) Cytokines

(D) Ethylene

48. Which of the following hormones is responsible for fruit ripening ?

(A) IBA

(B) NAA

(C) Abscissic acid

(D) Ethylene

49. Indole-3-acetic acid is the most common naturally occurring plant hormone of _____ class.

(A) Gibberellin

(B) Auxin

(C) Ethylene

(D) Cytokinin

50. _____ is a gaseous plant hormone.

(A) IBA

(B) Ethylene

(C) Abscisic acid

(D) NAA

51. Transport of auxin is :

(A) non-polar

(B) symplast

(C) apoplast

(D) polar

52. The leaf defoliator utilized in the Vietnam war by the U.S.A. known as "Agent Orange" was :

(A) 2, 4-D and 2, 4, 5-T

(B) Ethylene

(C) 2, 4-D and NAA

(D) 2, 4, 5-T, ethylene and NAA

53. Which of the following is not the component of water potential ?

(A) Osmotic potential

(B) Pressure potential

(C) Gravitational potential

(D) Assimilation potential

54. Which of the following is not the development zone of developing roots ?

(A) Radical zone

(B) Meristematic zone

(C) Elongation zone

(D) Maturation zone

55. Name of the protein, which is involved in the transfer of water across the cellular membrane ?

(A) Keratin

(B) Alanine

(C) Arginine

(D) Aquaporin

56. Name the term given to the movement of water against gravitational force, from root to the aerial parts of the plant :

(A) Ascent of sap

(B) Root pressure

(C) Radial movement

(D) Field capacity

57. Metabolic intermediates found in living system which are essential for growth and life is called _____.

(A) Saponins

(B) Tannins

(C) Secondary metabolites

(D) Primary metabolites

58. Which of the following is not the class of secondary metabolite ?

(A) Amino acids

(B) Terpenes

(C) Phenolics

(D) Alkaloids

59. How many isoprene units are there in sesquiterpenes ?

(A) 1

(B) 2

(C) 3

(D) 8

60. Name the class of secondary metabolites which is characterized by the presence of the hydroxyl group with an aromatic ring :

(A) Glycosides

(B) Phenolics

(C) Alkaloids

(D) Terpenes

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।