

KHAIRA COLLEGE KHAIRA, BALASORE
BOTANY QUESTION BANK
5TH SEMESTER
CC: 12 PLANT PHYSIOLOGY

1. Element present in nucleic acids, Phospholipids, ATP, ADP and NADPH is _____

- (A) P
- (B) Na
- (C) Bo

2. _____ are required for chlorophyll synthesis

- (A) Fe and Mg
- (B) Fe and Co
- (C) Cu and Ca
- (D) Mg and Ca

3. In which form Ca is present in plants?

- (A) Calcium pectate
- (B) Calcium carbonate
- (C) Calcium
- (D) CaCl

4. Nitrate reductase system in which element is major component?

- (A) Mo
- (B) N
- (C) H

5. Which element is essential for activating the enzyme but not a part of enzyme?

- (A) Mn
- (B) Mg
- (C) K
- (D) Co

6. For the selective permeability of the cell membranes which element is involved?

- (A) K
- (B) Fe
- (C) P

(D) Ca

7. Which element is essential for pollen germination?

(A) Na

(B) B

(C) Mo

(D) Co

8. In photosynthesis which element is essential for the evolution of oxygen?

(A) Cl

(B) Mg

(C) Fe

(D) All of the above

9. In leguminous plants leghemoglobin protects _____ activity

(A) Nitrogenase

(B) Protease

(C) Nitrate reductase

10. In Nitrogen fixation and metabolism which element is play major role?

(A) Mn

(B) B

(C) Mg

(D) Mo

11. Main source of elements for nitrate reductase is ferredoxin which is present in _____

(A) Endoplasmic reticulum

(B) Mitochondria

(C) Chloroplasts

(D) Golgi complex

12. Nitrobacter convert NO_2 into NO_3 in which process

(A) Reduction

(B) Oxidation

(C) Both A and B

(D) None of the above

13. Which element responsible of an anaerobic nitrogen fixing bacteria, Clostridium is _____

(A) Potassium

(B) Phosphorous

(C) Nitrogen

D) Sodium

14. In plant _____ is responsible for guttation

(A) Root pressure

(B) Photosynthesis

(C) Transpiration

(D) Osmosis

15. Root pressure introduced by Stephen Hales and it is absent in _____

(A) Mango

(B) Dicots

(C) Gymnosperms

(D) None of the above

16. Which is selectively permeable membrane of the cell

(A) Cell wall

(B) Cytoplasm

(C) Plasmalemma

(D) None of the above

17. Which plants Scotoactive stomata perform

(A) C₃ photosynthesis

(B) C₄ photosynthesis

(C) Both A and B

(D) CAM photosynthesis

18. The chemical use an antitranspirant is _____

(A) Salicylic acid

(B) Abscisic acid

(C) Phenylmercuric acid

(D) All of the above

19. Sub epidermal evaporation of water exhibit in plant during

(A) Photosynthesis

(B) Guttation

(C) Respiration

(D) Transpiration

20. The best light for stomatal opening is _____

(A) Red

(B) Yellow

- (C) Green
- D) Blue

21. During high wind velocity, the stomata of plants

- _____
- (A) Remain open
 - (B) Close down
 - (C) Open more widely
 - (D) Remain unaffected

22. Optimum temperature for water absorption is _____

- (A) 0 – 5 °C
- (B) 20 – 25 °C
- (C) 45 – 65 °C
- (D) 5 – 20 °C

23. The transport of sap from root to top of the dicot plant is _____

- (A) Transport
- (B) Translocation
- (C) Ascent of sap
- (D) All of the above

Ans. C

24. Selective passage across a semipermeable membrane is called _____

- A) Osmosis
- (B) Diffusion
- (C) Both A and B
- (D) Imbibition

25. Stomata open at night but close during day time in which plants?

- (A) Xerophytes
- (B) Mesophytes
- (C) Succulents
- (D) Both A and B

26. In the plant number of stomata present per cm of a common leaf is about

- (A) 2 million
- (B) More than 100000
- (C) 10000
- (D) Less than 100

27. The most important factor in stomatal opening in the plant is _____

- (A) Protein percentage of sap
- (B) Shape of guard cells
- (C) Hormone content of cell
- (D) Chlorophyll content in cell

28. Which plant hormone is associated with closing of stomata?

- (A) IBA
- (B) GA
- (C) ABA
- (D) All of the above

29. Which enzyme plays major role in opening and closing of stomata?

- (A) Beta-amylase
- (B) Pyruvic kinase
- (C) RuDP
- (D) PEP carboxylase

30. Absorption of water and minerals take place in which part of root?

- (A) Root cap tip
- (B) Root hairs
- (C) Root epidermis
- (D) Root endodermis

31. The highest root pressure exhibit in plants is

-
- (A) 4 bars
 - (B) 15 bars
 - (C) 10 bars
 - (D) None of the above

32. Which nutrient is obtained by insectivorous plants from insect bodies?

- (A) P
- (B) K
- (C) N
- (D) Na

33. In Himalayan forest commonly N_2 fixing bacteria is

- (A) Azotobacter
- (B) Frankia
- (C) Nitrobacter
- (D) None of the above

34. The enzyme responsible for atmospheric nitrogen fixation is _____

- (A) Nitrogenase
- (B) Amylase
- (C) Nitrogenase and Amylase
- (D) Lemda nitrogenase

35. In which method ions are absorbed by plants

- (A) By carriers and pumps
- (B) By carriers method
- (C) By difference in DPD
- (D) By molecular diffusion

36. The most effective cofactor for enzyme is _____

- (A) Mn
- (B) Na
- (C) K
- (D) Ca

37. Flowering plants adapted to absorb which ions

- (A) NO_3^-
- (B) NO_3^{+2}
- (C) NH_3
- (D) NO_2

38. Bidirectional translocation of minerals occurs in plants

- (A) Phloem
- (B) Xylem
- (C) Cambium
- (D) Perenchyma and phloem

39. Nodule formation of legume roots is reduced during deficiency of _____

- (A) S and B
- (B) N
- (C) K
- (D) Cl

40. Boron help in _____

- (A) Photosynthesis
- (B) Sugar transport
- (C) Acting as a co-factors
- (D) Both A and C

41. Nitrification process is done by _____

- (A) Rhizobium
- (B) B. bassiana
- (C) Pseudomonas
- (D) Nitrococcus

42. Transpiration mostly affected by _____

- A) Humidity
- (B) Temperature
- (C) Light
- (D) Wind

43. Transpiration pull help in passive absorption of water that depends on _____

- (A) Negative water potential of atm.
- (B) Cohesion and adhesion of water
- (C) Positive water potential
- (D) Both B and C

44. In plants stomatal movement is known as _____

- (A) Nastic movement
- (B) Physiotactic movement
- (C) Geotactic movement
- (D) Phototaxic movement

45. Which enzyme is not proteinaceous in nature?

- (A) Ribozyme
- (B) Both A and B
- (C) Isozyme
- (D) Trypsin

46. Below the freezing point enzyme are inactivated but at which temperature activity would be maximum?

- (A) 22°C
- (B) 35°C
- (C) 54°C
- (D) 25°C

7. Phosphofructokinase major enzyme in glycolysis is inhibited by _____

- (A) ATP
- (B) ADP
- (C) Citrate
- (D) Both A and C

48. Pyruvate dehydrogenase complex and glycolytic pathway is located in _____

- (A) Cytosol and Mitochondria
- (B) Cytosol
- (C) Golgi bodies
- (D) Microsomes

49. Which is responsible for Acetyl CoA carboxylase activation

- (A) Citrate and insulin
- (B) Isozyme
- (C) Trypsin
- (D) All of the above

50. Most C₄ plants are native _____

- (A) Xerix habitats
- (B) Merine habitats
- (C) Grass habitats
- (D) All habitats

51. Photosynthetic yield will be maximum in _____

- (A) Intermittent white light
- (B) Continuous blue light
- (C) Red light
- (D) Yellow light

52. Photosynthetically active radiation wavelength ranging from _____

- (A) 340 – 450
- (B) 200 – 300
- (C) 400 – 700
- (D) 640 – 650

53. Which is involve in photosynthesis

- (A) Blackman and Hill
- (B) Krebs cycle reaction
- (C) E.M.P. Pathway
- (D) None of the above

54. Hill reaction take place in Granna formed

- (A) ATP and NADPH₂ both
- (B) NADPH₂
- (C) ADP
- (D) All of the above

55. Photosynthesis is most active and fast in _____

- (A) Blue light
- (B) White light
- (C) Red light
- (D) UV light

56. Which is immediate electron donor to PS-I

- (A) Plastocyanin
- (B) Plastomethionin
- (C) Ferredoxinin
- (D) Both B and C

57. Anabolic process is _____

- (A) Photosynthesis
- (B) Transpiration
- (C) Both A and B
- (D) None of the above

58. Absorption of light take place during photosynthesis

- (A) Photosystem-I only
- (B) Photosystem-II only
- (C) Photosystem-I and Photosystem-II
- (D) None of the above

59. In C₄ pathway

- (A) O₂ combine with PGA
- (B) CO₂ combine with PEP
- (C) CO₂ combine with RMP
- (D) All of the above

60. Dark reaction of photosynthesis occurs in _____

- (A) Stomata
- (B) Stroma and matrix
- (C) Stroma
- (D) Granna

61. In C₄ plants first CO₂ acceptor is _____

- (A) Oxaloacetic acid
- (B) Phosphoenol-pyruvate
- (C) Oxalo butaric acid

(D) Pyruvic acid

62. Kranz anatomy found in _____

(A) Leaves

(B) Stem

(C) Flower

(D) Seed

63. Calvin cycle involves reductive carboxylation occurs in

(A) Chloroplast

(B) Cytochrom

(C) Peroxisome

(D) Cytoplasm

64. RUBISCO content of chlorophyll is _____

(A) 10%

(B) 15%

(C) 5%

(D) 7%

65. Dye used in Hill reaction by Stephan Hill

(A) Methylene blue

(B) Erosine

(C) Sulphure green

(D) Both A and B

66. First stable product of C₄ photosynthesis is

(A) Malic acid

(B) Rubilose 1, 5, biophosphate

(C) Phosphoglyceric acid

(D) Both B and C

67. At which time acid concentration in CAM plants is maximum

(A) Dusk

(B) Dawn

(C) Night

(D) Day

68. During photosynthesis which element is essential for photolysis of water?

(A) Co

(B) C

(C) Cl

(D) N

69. Respiratory quotient (R.Q.) is less than one when the respiratory substrate is _____

(A) Sucrose

(B) Fat

(C) Glucose

(D) Fructose

70. Number of ATP produced from one pyruvic acid during conversion of acetyl CoA is _____

(A) 5

(B) 10

(C) 3

(D) 1

71. During aerobic respiration net number of water molecules produced per molecule of glucose is _____

(A) 6

(B) 5

(C) 4

(D) 8

72. Net ATP molecules formed in glycolysis is _____

(A) 38

(B) 12

(C) 2

(D) 1

73. One NADH_2 produce number of ATP is _____

(A) 6 ATP

(B) 1 ATP

(C) 38 ATP

(D) 3 ATP

74. Glycolysis takes place in cytoplasm and the end product is _____

(A) Pyruvic acid

(B) Oxalic acid

(C) Glucose

(D) 30 ATP

75. Calvin cycle is reductive carboxylation and final product of this cycle is _____

- (A) Pyruvic acid
- B) Phosphoglycer-aldehyde
- (C) Phosphoglyceric acid
- (D) Both A and B

76. TCA cycle occur in mitochondria and intermediate between glycolysis and TCA cycle is _____

- (A) Oxaloacetate
- (B) Pyruvic acid
- (C) Acetyl-Co A
- (D) Both A and B

77. The net gain of energy from one molecule of sucrose in aerobic respiration is _____

- (A) 38 ATP
- (B) 76 ATP
- (C) 37 ATP
- (D) 79 ATP

78. The net gain of energy from one gram mole of glucose during aerobic respiration is _____

- (A) 36 ATP
- (B) 42 ATP
- (C) 38 ATP
- D) 40 ATP

79. When 4 molecules of phosphoglyceraldehyde are converted into 4 molecules of pyruvate than how many molecules of NADH are produced

- (A) 2
- (B) 7
- (C) 4
- (D) 8

80. Cytochromes help in plant growth, which is reacts with O₂ in electron transport system

- (A) Cyt. a₃
- (B) Cyt. b₃
- (C) Cyt. c₃
- (D) Cytf

81. Common precursor in CAM, UMP and TMP is

-
- (A) Aspartate
 - (B) Glutamine
 - (C) Glutamate
 - (D) Adenosine

82. Tox 1 molecule of N 12 ATP molecule are required and N fixation is carried out by the enzyme

- (A) Nitrogenase and Rubisco
- (C) Nitrite reductase only
- (B) Nitrogenase only
- (D) Nitrate reductase

3. The natural occurring in higher plant is _____

- (A) IAA
- (B) IBA
- (C) NAA
- (D) IBA and NAA

84. Dwarfness of the plant can be control by _____

- (A) IAA
- (B) MH
- (C) GA
- (D) IBA

85. Polar translocation of plant hormone found in

-
- (A) Auxin
 - (B) GA
 - (C) Cytokinin
 - D) Zeatin

86. An essential growth substance required in tissue culture and delay the chlorophyll loss

- (A) GA
- (B) Kinetin
- (C) Cytokinin
- (D) Auxin

87. Tress hormone is _____

- (A) GA
- B) IAA
- (C) ABA

(D) Both A and B

88. Flowering of short day and long day plant is promoted by _____

- (A) IAA and GA respectively
- (B) GA only
- (C) Cytokinin and GA respectively
- (D) Kinetin and GA respectively

89. Chemitropism is _____

- (A) Growth of pollen tube toward ovule
- (B) Growth of pollen tube stigma to ovary
- (C) Movement of anthozoids
- (D) Both A and B

90. Hormone involve in phototropism is _____

- (A) IAA
- (B) GA
- (C) Kinetin
- (D) Cytokinin

Section –B

Unit- 1

1. Difference between the diffusion and osmosis.
2. Discuss about the water and chemical potential .
3. Explain the mechanism behind the absorption of water.
4. Difference between the active and passive absorption.
5. Define the transpiration and their significance.
6. What are the factors affecting the transpiration?
7. Classify the stomata based on their movement.
8. Discuss about physiology of stomatal movement.
9. Explain- steward scheme in stomatal movement.
10. What are the factor affecting the stomatal movement and how?
11. Write any three theories that deal with stomatal movement?
12. Write the role of stomatal in plant physiology?
13. Difference between transpiration and guttation.
14. Explain – Munch mass theory.
15. Explain –cohesion and adhesion theory.
16. Write down the evidence that prove the direction of translocation of carbohydrate.

Unit -2

17. Write about Receptors and G-proteins in brief.
18. Explain about phospholipid signaling.
19. What are the roles of cyclic nucleotides?
20. Write about Calcium – Cadmium cascade.
21. Write about minerals nutrition and its elements.
22. List out the role of essential element.
23. Write short note on nutrient uptake and transport mechanism.
24. What are the roles of cell membrane in plants?
25. Write about ion pump carrier.
26. Write down the role of essential elements.

Unit-3

27. What is mean by Photosynthesis? Write its significance.
28. What are Photosynthetic pigments?
29. Explain about Photo protective carotenoids.
30. Write a short note on reaction center complexes.
31. Explain about electron transport pathway in chloroplast membrane.
32. Define Photo phosphorylation. Write its significance.
33. What is calvin cycle and explain its significance.
34. What is the difference between C4 cycle and C3 cycle?
35. What is the difference between C2 cycle and C3 cycle?
36. Define photorespiration and write its significance.

Unit – 4

37. Write a detailed note on TCA cycle and its significance.
38. Write difference between aerobic and anaerobic respiration.
39. List out the importance of nitrogen to plants.
40. What is called biological nitrogen fixation? Explain it in brief.
41. Define Glycolysis. Write its importance to plants.
42. Write a note on oxidative phosphorylation.
43. Define PPP and write its significance.
44. Write about GS pathway.
45. Explain about nitrate assimilation in brief.
46. Write a note on carbohydrate synthesis.

Unit-5

47. Explain about physiology of flowering.
48. What are the Physiological role of photochrome and cytochrome.
49. Explain the concept of photoperiodism.

50. Define and write the conditions of vernalization techniques.

51. Write a short note on biological clock. 52.

Write the history and mechanism of ABA.

53. Write about the types of senescence.

54. Explain about the mechanism of abiotic stress tolerance.

55. Write the mechanism of fruit ripening.