

The Bodwad Sarvajanic Co- Op. Education Society Ltd., Bodwad

Arts, Commerce and Science College, Bodwad.

Question Bank

Class :- S.Y. B.Sc.

Sem :- IV

Subject:- Botany

Paper:- Plant Metabolism

1. What is an apoenzyme?

a) It is a protein portion of an enzyme

b) It is a non-protein group

c) It is a complete, biologically active conjugated enzyme

d) It is a prosthetic group

2. Holoenzyme is made of

a) Apoenzyme and Zymogen

b) Apoenzyme and Co-enzyme

c) Co-enzyme and Prosthetic group

d) Prosthetic group and Co-factor

3. Activity of allosteric enzymes are influenced by

a) Allosteric modulators

b) Allosteric site

c) Catalytic site

d) None of the above

4 . Apoenzyme is a

a) Protein

b) Carbohydrate

c) Vitamin

d) Amino acid

5. Who coined the word enzyme?

a) Wilhelm Kuhne

b) Alfred Russel

c) Robert Koch

d) Rosalind Franklin

6. Which of the following enzyme catalyzes the transfer a group from one molecule to another?

a) Transferase

b) Oxidoreductase

c) Hydrolase

d) All of the above

7. Non protein part of the conjugated protein is called ...

a) Cofactor

b) Prosthetic group

c) Coenzyme

d) none

8. The coenzyme is ...

a) Often a metal

b) always a protein

c) Often a vitamin

d) always an inorganic compound

9. Which of the following is called biological middle man

a) Hormone

b) Vitamin

c) Enzyme

d) All the above

10.are the catalyst which speed up the chemical reaction

a) Substrate

b) Product

c) Reactant

d) enzymes

11. The water-soluble photosynthetic pigment is

(a) Chlorophyll a

(b) Xanthophyll

(c) Anthocyanin

(d) Chlorophyll b

12. Chemically most of the enzymes are in nature

a) Acidic

b) Basic

c) Amphoteric

d) Neutral

13. Enzymes are polymers of

a) Fatty acids

b) Amino acids

- c) Hexose sugar
- d) Inorganic phosphate

14. Chemical compounds involved in the process of metabolism is known as _____

- a) Metabolites**
- b) Radicals
- c) Catabolites
- d) Intermediates

15. The catabolic pathway is exergonic in nature.

- a) True**
- b) False

16. Name the type of the pathway which is involved in the synthesis of compounds?

- a) Anabolic pathways**
- b) Catabolic pathways
- c) Amphibolic pathway
- d) Anapleurotic pathway

17. The Pathway is exergonic in nature

- a) Anabolic pathways
- b) Catabolic pathways**
- c) Metabolic
- d) none

18. Which of the following is an anoxygenic photosynthetic organism?

- a) Plants
- b) Photosynthetic protists
- c) Cyanobacteria
- d) Green and Purple photosynthetic organism**

19. Name the pigment which is responsible for the yellow color of leaves in autumn and orange color of carrots?

- a) Phycobilins
- b) Chlorophylls
- c) Carotenoids**
- d) Bacteriochlorophyll

20. Name the photosynthetic pigment which is structurally similar to bile pigment bilirubin?

- a) Chlorophyll

- b) Carotene
- c) Xanthophyll
- d) Phycobilins**

21. Which metal ion is a constituent of chlorophyll?

- a) Iron
- b) Copper
- c) Magnesium**
- d) Zinc

22. In light phase of photosynthesis there is formation is

- a) ATP
- b) NADPH₂
- c) Both ATP and NADPH₂**
- d) Carbohydrates

23. Photophosphorylation consists of

- a) Cyclic and non-cyclic phosphorylation**
- b) Oxidative phosphorylation
- c) Substrate phosphorylation
- d) None of the above

24. In C₄-plants, photosystem II is absent in chloroplasts of

- a) Mesophyll cells
- b) Bundle sheath cells**
- c) Palisade cells
- d) Spongy cells

25. The carbon dioxide acceptor in CAM plants is

- a) Malic acid
- b) Oxalo-acetic acid
- c) Pyruvic acid
- d) Phosphoenol pyruvic acid**

26. The first stable product in CAM/C₄ plants is

- a) Starch
- b) Oxalo-acetic acid
- c) Sugar
- d) Malic acid**

27. When chlorophyll absorbs light, it gets excited and emits (release)

- a) Oxygen
- b) Water
- c) Electrons**
- d) Energy rich compounds

28. Kranz anatomy is found in

- a) Stems of C4 plants
- b) Stems of C3 plants
- c) Leaves of C4 plants**
- d) Leaves of C3 plants

29. Calvin cycle operates in chloroplasts. Where does Hatch-Slack pathway occur

- a) Mitochondria
- b) Golgi bodies
- c) Chloroplasts**
- d) Cytoplasm

30. Which one is directly involved in light reaction of photosynthesis

- a) Chlorophyll a**
- b) Chlorophyll b
- c) Carotenoids
- d) All the above

31. Photosynthesis pigments are located in the chloroplast in

- a) Intrathylakoid space
- b) Thylakoid membranes**
- c) Intermembrane space
- d) Inner membrane of envelope

32. Source of proton within the chloroplast is

- a) Water**
- b) Excited chlorophyll
- c) Carbon dioxide
- d) Rubisco

33. Dark reaction of carbon assimilation occur in

- a) Cytoplasmic matrix
- b) Mitochondria
- c) Leucoplasts

d) Chloroplasts

34. NADPH is produced in photosynthesis during

a) Dark reaction

b) Noncyclic photophosphorylation

c) Pseudocyclic photophosphorylation

d) Cyclic photophosphorylation

35. Energy required for ATP synthesis in ps II comes from

a) Proton gradient

b) Electron gradient

c) Reduction of glucose

d) Oxidation of glucose

36. Electron donor to PSI is

a) Ferredoxin

b) FeS centre

c) Plastoquinone

d) Plastocyanin

37. In cyclic photophosphorylation the electron released by reaction centre is ultimately accepted by

a) Ferredoxin

b) NADP+

c) Reaction centre

d) Plastocyanin

38. The optimum temperature for photosynthesis is

(a) 25-35°C

(b) 10-15°C

(c) 35-40°C

(d) 20-25°C

39. Photorespiration involves oxidation of

(a) PGA

(b) RuBP

(c) Chlorophyll a

(d) Both a and b

40. C3 and C4 plants differ with respect to

- (a) Number of ATP molecules consumed
- (b) First product
- (c) The substrate which accepts carbon dioxide
- (d) All**

41. Where does the light reaction takes place?

- (a) Grana**
- (b) Stroma
- (c) Cytoplasm
- (d) Endoplasmic reticulum

42. Electrons from the excited chlorophyll molecules of PS-II are first accepted by

- (a) Pheophytin**
- (b) Ferredoxin
- (c) Cytochrome f
- (d) Cytochrome b

43. Maximum photosynthesis occurs in

- (a) Blue light
- (b) Red light**
- (c) White light
- (d) Green light

44. The first acceptor of CO₂ in C₄ plants is

- (a) Aspartic acid
- (b) Malic acid
- (c) Oxaloacetic acid
- (d) Phosphoenolpyruvate**

45. The first product of C₄ pathway is

- (a) PGA
- (b) DHAP
- (c) Oxaloacetate**
- (d) Phosphoenolpyruvate

46. The two pigment system theory of photosynthesis was proposed by

- (a) Aron
- (b) Blackman
- (c) Hill
- (d) Emerson**

47. H₂ donor during photosynthesis is

- (a) ATP
- (b) NADP
- (c) NADPH**
- (d) NADH

48. Glycolysis is also known as _____

- a) EMP pathway**
- b) TCA pathway
- c) carbon sequestration
- d) None of the above

49. Respiration results in _____

- a) Release of oxygen
- b) Anabolism
- c) Release of carbon dioxide**
- d) Transfer of carbon dioxide

50. The product of glycolysis is _____

- a) Pyruvate**
- b) Lactic acid
- c) NADH
- d) Acetyl coA

51. Where in the cell most of the aerobic respiration takes place?

- a) Mitochondria**
- b) Nucleus
- c) Ribosome
- d) Cytoplasm

52. Which of the following occurs both in photosynthesis and respiration?

- a) Krebs cycle**
- b) Glycolysis
- c) Calvin cycle
- d) Chemiosmosis

53. The different steps of aerobic respiration are

- a) Glycolysis and oxidative phosphorylation
- b) Glycolysis and Krebs cycle
- c) Glycolysis, Krebs cycle and terminal oxidation**

d) Krebs cycle and terminal oxidation

54. Phosphorylation of glucose with the help of ATP and hexokinase produces

a) Glucose 1-phosphate

b) Glucose 6-phosphate

c) Glucose 1,6-bisphosphate

d) Fructose 1,6-bisphosphate

55. Which one is removed from substrate during glycolysis

a) Hydrogen

b) Electrons

c) Both A and B

d) Oxygen

56. Site of glycolysis or EMP is

a) Mitochondria

b) Cytoplasm

c) E.R.

d) Ribosomes

57. Which is formed along with ATP in glycolysis

a) NADH

b) NADPH

c) FAD

d) FADH₂

58. The ultimate electron acceptor of respiration in an aerobic organisms is:

a) Cytochrome

b) Oxygen

c) Hydrogen

d) Glucose

59. Electron Transport System (ETS) is located in mitochondrial

a. Outer membrane

b. Inter membrane space

c. Inner membrane

d. Matrix

60. Which of the following is also known as Krebs cycle?

a) Electron transport chain

b) Glycolysis

- c) **TCA cycle**
- d) DNA Replication

61. In the TCA cycle, which of the following combines with Acetyl CoA to form a 6 carbon compound?

- a) **oxaloacetate**
- b) glucose
- c) pyruvate
- d) thiamine

62. Which enzyme catalyzes the conversion of isocitrate to alpha-ketoglutarate?

- a) **Isocitrate dehydrogenase**
- b) Isocitrate carboxylase
- c) Alpha-ketoglutarate dehydrogenase
- d) Aldolase

63. Which of the following is the first complex (Complex I) of ETS?

- (a) **NADH dehydrogenase**
- (b) Cytochrome aa₃
- (c) Cytochrome bc₁
- (d) ATP synthase

64. Ubiquinone transfers its electrons to

- (a) Complex I
- (b) Complex II
- (c) matrix
- (d) **Cyt c**

65. Oxidative phosphorylation results in the formation of

- (a) Oxygen
- (b) ADP
- (c) **ATP + H₂O**
- (d) NADH

66. Which of the following is the Complex IV of ETS?

- (a) NADH dehydrogenase
- (b) **Cytochrome c oxidase**
- (c) Cytochrome bc₁
- (d) Succinate dehydrogenase

67. TCA cycle generates how many ATP molecules?

- a) 10 ATP
- b) 12 ATP
- c) 20 ATP
- d) 24 ATP**

68. _____ is a product of aerobic respiration

- (a) Malic acid**
- (b) Pyruvate
- (c) Ethylene
- (d) Lactose

69. Which of the following are the two types of fermentation that can occur during anaerobic respiration?

- a) Glycolysis and fermentation
- b) Alcohol fermentation and lactic acid fermentation**
- c) Lactic acid and ethanol
- d) Aerobic and anaerobic

70. The nodule forming bacteria are:

- (a) Azotobacter
- (b) Nitrobacter
- (c) Clostridium**
- (d) Rhizobium

71. Nitrogen is absorbed by the plants in the form of

- (a) Ammonium
- (b) Nitrites
- (c) Nitrates
- (d) All**

72. 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

73. Important enzymes involved in nitrogen fixation are

(a) Nitrogenase and hydrogenase

(b) Nitrogenase and hexokinase

(c) Nitrogenase and peptidase

(d) Nitrogenase and hydrolyase

74. Conversion of nitrates to nitrogen is called

(a) Ammonification

(b) Nitrification

(c) Nitrogen fixation

(d) Denitrification

75. Formation of organic nitrogen compounds like amino acids from inorganic nitrogen compounds is called as _____

a) Nitrogen fixation

b) Nitrification

c) Denitrification

d) Nitrogen assimilation

76. Ammonia or ammonium is oxidized to nitrite followed by the oxidation of nitrite to nitrate is called _____

a) Nitrogen fixation

b) Nitrification

c) Denitrification

d) Nitrogen assimilation

77. Nitrate is reduced and ultimately produces N_2 through a series of intermediate gaseous nitrogen oxide products is called _____

a) Nitrogen fixation

b) Nitrification

c) Denitrification

d) Nitrogen assimilation

78. Enzyme required for nitrogen fixation is

a) Nitrogen deaminase

b) Nitrodioxidase

c) Amino acid decarboxylase

d) Nitrogenase

79. The chief source of nitrogen for green plants is

- a) atmospheric nitrogen
- b) nitrates
- c) ammonium salts
- d) low molecular weight- organic nitrogenous compound

80. Respiration is an

- a) Endothermic process
- b) Exothermic process**
- c) Anabolic process
- d) Endergonic process

81. Respiratory enzymes are located in

- a) Mitochondrial matrix**
- b) Perimitochondrial space
- c) Cristae
- d) Outer membrane

82. Who discovered photophosphorylation?

- a) D David
- b) D Benjamin
- c) D Arnon**
- d) D Robert

83. The **inactivation of photosynthesis is known as photo inhibition.**

- a) True**
- b) False

84. Name the external factors that affect photosynthesis process?

- A. Light Intensity
- B. Carbon dioxide concentration
- C. Temperature
- D. All of the above**

85. Photosynthesis is :

A. An Oxidation-Reduction reaction

B. Synthesis reactio

C. Organic reaction

D. Replacement reaction