



BIOLOGY

BOOKS - MBD BIOLOGY (ODIA ENGLISH)

RESPIRATION IN PLANTS

Question Bank

1. Which of the following is produced in oxidative pentose phosphate pathway?

A. Pyruvic acid

B. Acetyl CoA

C. $NADH_2$

D. NADPH

Answer: D



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2. Cytochrome oxidase is a/an:

A. Exoenzyme

B. Endoenzyme

C. Proenzyme

D. Coenzyme

Answer: B



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3. Lactic acid is formed by the process of:

A. Fermentation

B. Glycolysis

C. HMP pathways

D. None of them

Answer: A



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4. Which one is not correct about Krebs' cycle

?

A. It is also called citric acid cycle

- B. The intermediate' compound which links glycolysis with krebs' cycle is malic acid
- C. It occurs in mitochondria
- D. It starts with six carbon compound

Answer: B



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5. The net gain of ATP during glycolysis is:

A. six

B. eight

C. two

D. four

Answer: C



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6. The overall goal of glycolysis, Krebs' cycle and the electron transport system is the formation of:

A. ATP in one large oxidation reaction

B. Sugars

C. Nucleic acids

D. ATP in small stepwise units

Answer: D



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7. Glycolysis occurs in:

A. Nucleus

B. Cytoplasm

C. Mitochondria

D. Lysosome

Answer: B



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8. In glycolysis enzyme playing key role in splitting 6C compound into 3C compound is:

A. Hexokinase

B. Aldolase

C. Isomerase

D. None of these

Answer: B



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9. The energy releasing process in which the substrate is oxidised without an external electron acceptor is called :

A. Aerobic respiration

B. Glycolysis

C. Fermentation

D. Photorespiration

Answer: B



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10. The chemiosmotic coupling hypothesis of oxidative phosphorylation processes that

adenosine triphosphate (ATP) is formed because:

A. A proton gradient forms across the inner membrane

B. There is a change in the permeability of the inner mitochondrial membrane toward adenosine diphosphate(ADP)

C. High energy bonds are formed in mitochondrial proteins.

D. ADP is pumped out of the matrix into the intermembrane space

Answer: A



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11. The end product of glycolysis is:

A. Pyruvate

B. Oxalo acetate

C. Glucose

D. Galactose

Answer: A



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12. The details of tricarboxylic acid path was worked out by:

A. Meischer

B. Hans Krebs

C. Pasteur

D. None of these

Answer: B



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13. In succulent plants like Opuntia,, the RQ value will be:

A. Less than 1

B. More than 1

C. Infinity

D. Zero

Answer: D



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14. What is the net ATP molecules gain, when 4 molecules of glucose undergo anaerobic respiration in plants ?

A. 8 ATP

B. 20ATP

C. 144ATP

D. 16ATP

Answer: A



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15. The R.Q. is less than 1.0 in a respiratory metabolism, it would mean that:

A. Carbohydrates are used as respiratory substrate

B. Organic acids are used as respiratory substrate

C. The oxidation of the respiratory substrate consumed more oxygen than the amount of CO_2 released

D. The' oxidation of the respiratory substrate consumed less oxygen than the amount of CO_2 released

Answer: C



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16. In cellular respiration, the final acceptor molecule of proton is:

A. NAD

B. FAD

C. NADP

D. Oxygen

Answer: D



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17. Oxidative phosphorylation refers to:

- A. Anaerobic production of ATP
- B. The citric acid cycle production of ATP
- C. Production of ATP by chemiosmosis
- D. Alcoholic fermentation

Answer: C



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18. The respiratory quotient during cellular respiration would depend on:

- A. The amount of carbon dioxide released
- B. The amount of oxygen utilised
- C. The nature of enzymes involved
- D. The nature of the substrate

Answer: D



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19. Acetyl CoA is produced from pyruvate by:

- A. Oxidative decarboxylation
- B. Oxidative photophosphorylation
- C. Oxidative hydrogenation.
- D. Oxidative photorespiration

Answer: A



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20. During aerobic respiration maximum ATP is synthesized by:

A. ETS

B. Krebs' cycle

C. Glycolysis

D. Fermentation

Answer: A



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21. In which of the following O_2 is directly used:

A. Glycolysis

B. Fermentation

C. Electron transport chain

D. Oxidative decarboxylation

Answer: C



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22. Which of the following is the key intermediate compound linking glycolysis to krebs' cycle?

A. NADH

B. ATP

C. Acetylene CoA

D. Malic acid

Answer: C



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23. FAD acts as an electron acceptor in between:

- A. Fumaric and malic acid
- B. Succinic and fumaric acid
- C. Malate and oxaloacetic acid
- D. Citric and isocitric acid

Answer: B



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24. In Krebs' cycle OAA accepts acetyl CoA to form:

- A. Citric acid
- B. Succinate
- C. Fumarate
- D. Succinyl CoA

Answer: A



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25. The number of ATP produced when a molecular of glucose undergoes fermentation is:

A. 4

B. 36

C. 2

D. 38

Answer: C



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26. In mitochondria, protons accumulate in the:

- A. Outer membrane
- B. Inner membrane
- C. Intermembrane space
- D. Matrix

Answer: C



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27. The TCA enzyme is found in:

- A. Peroxisomes
- B. Ribosomes
- C. Mitochondrial matrix
- D. Cytoplasm

Answer: C



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28. Chemiosmotic theory of ATP synthesis in the mitochondrion is based on:

A. Ca^{++} gradient

B. K^+ gradient

C. H^+ gradient

D. Na^+ gradient

Answer: C



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29. In aerobic respiration, total number of ATP molecules formed from 1 glucose molecule is:

A. 38

B. 32

C. 36

D. 30

Answer: C



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30. The substrate for pentose phosphate pathway is:

- A. Glucose-6-phosphate
- B. Glucose-1-phosphate
- C. Fructose-6-phosphate
- D. Fructose-1-phosphate

Answer: A



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31. How many ATP molecules will be generated in a plant system during complete oxidation of 40 moles of glucose ?

A. 190

B. 380

C. 1520

D. 3040

Answer: C



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32. Mitochondria are store house of:

A. Glycogen

B. Glucose

C. ATP

D. Fat

Answer: C



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33. Respiration is:

A. Anabolic process

B. Catabolic process

C. Chemical process

D. Oxidative process

Answer: B



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34. Raw materials for respiration is:

A. Glucose and CO_2

B. Glucose and fructose

C. Glucose and Pyruvate

D. Glucose and O_2

Answer: D



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35. Total ATP molecules produced during EMP pathway is:

A. 6

B. 8

C. 36

D. 38

Answer: B



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36. Respiration is an _____ process.

A. Exothermic

B. Endothermic

C. Endergonic

D. Anabolic

Answer: A



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37. Oxidation of $FADH_2$ results in formation of:

A. 3 ATP

B. 2 ATP

C. 1 ATP

D. No ATP

Answer: B



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38. During respiration, if



X may be:

A. Glucose

B. Organic

C. Fat

D. Protein

Answer: C



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39. RQ is highest in:

A. Glucose

B. Fat

C. Protein

D. Malic acid

Answer: D



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40. Cytochromes act as:

A. CO_2 acceptor

B. O_2 acceptor

C. Electron acceptor

D. Proton acceptor

Answer: C



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41. What causes RQ to vary?

A. Respiratory product

B. Respiratory substrate

C. Temperature

D. Light & O_2

Answer: B



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42. In eukaryotes net gain of ATP in complete oxidation of one molecule of glucose is:

A. 20 ATP

B. 36 ATP

C. 38 ATP

D. 56 ATP

Answer: B



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43. Which is the link between glycolysis and Krebs cycle?

A. Glucose

B. Cytochrome

C. Acetylene-CoA

D. Pyruvate

Answer: C



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44. Which one yields the maximum energy?

A. Krebs cycle

B. Anaerobic respiration

C. Glycolysis

D. Aerobic respiration

Answer: D



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45. How much usable energy is available during oxidative combustion of 1 gm mole of glucose in the body?

A. 686000 cal

B. 304000 cal

C. 277400 cal

D. 686 cal

Answer: A



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46. Correct sequence of electron acceptors in ATP synthesis is:

A. Cyt a, a_3 , b,c

B. Cyt b, c, a, a_3

C. Cyt c, b, a, a_3

D. Cyt b, c, a_3 , a

Answer: B



47. Electron transport system of mitochondria is located in:

- A. Outermembrane
- B. Inner membrane
- C. Inter-cristal space
- D. Outer chamber

Answer: B



48. In respiration 180 gm of glucose with 192 gm of oxygen produces:

A. 108 gm of water, 264 gm of CO_2 , 686 kcal of energy

B. 100 gm of water, 384gm of CO_2 , 686 kcal of energy

C. 348 gm of water, 108 gm of CO_2 , 686 kcal of energy

D. 108 gm of water 348 gm of CO_2 , 868

Answer: A



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49. Enzymes of Krebs cycle are located in the matrix of mitochondria except one which is located in the inner mitochondrial membrane.

Name the enzyme.

A. Citrate synthetase

B. α - ketoglutarate dehydrogenase

C. Succinate dehydrogenase

D. Malate dehydrogenase

Answer: C



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50. In plant cell glycolysis operates in:

A. Mitochondria

B. Peroxisome

C. Mesosome

D. Cytoplasm

Answer: D



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51. How many molecules of oxygen are used during glycolysis of one glucose molecule ?

A. 38

B. 34

C. 2

D. 0

Answer: D



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52. The reactions of TCA cycle occur in:

A. Ribosomes

B. Grana

C. Mitochondria

D. Endoplasmic reticulum

Answer: C



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53. In anaerobic respiration the net gain of ATP per glucose molecule oxidised is.:

- A. 2 ATP molecules
- B. 4 ATP molecules
- C. 30 ATP molecules
- D. 6 ATP molecules

Answer: A



54. Which of the following is common to both aerobic and anaerobic respiration ?

A. ETC

B. Glycolysis

C. Krebs cycle

D. Oxidative decarboxylation

Answer: B



55. End product of glycolysis is:

- A. Lactic acid
- B. Pyruvic acid
- C. Aspartic acid
- D. Acetyl-CoA

Answer: B



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56. Main source of ATP in a cell is:

A. Glycolysis

B. ETS

C. Krebs cycle

D. Fermentation

Answer: B



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57. In the ETC, the final cytochrome acting as electron acceptor is:

- A. Cytochrome b
- B. Cytochrome a
- C. Cytochrome a₃
- D. O₂

Answer: D



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58. Hexose monophosphate pathway occurs in:

A. Mitochondrial matrix

B. Cristae

C. Cytoplasm

D. ER

Answer: C



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59. During ripening of some fruits (e.g. apple, banana), there is sudden increase in sudden increase in respiration rate which is called:

- A. Climacteric
- B. Climatic
- C. Pasteur effect
- D. Anthesis

Answer: A



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60. Which of the followings yields the highest energy per gram ?

A. Glucose

B. Amino acid

C. Protein

D. Fat

Answer: D



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61. In aerobic respiration, one citric acid cycle synthesizes how many ATP molecules ?

A. 38

B. 36

C. 15

D. 2

Answer: D



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62. Other name of glycolysis is:

A. EMP-pathway

B. TCA cycle

C. HMS-pathway

D. Carbon-pathway

Answer: A



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63. Out of 38 ATP molecules produced per glucose, 30 ATP molecules are formed from

$NAD\frac{H}{F}ADH_2$ in:

A. EMP

B. Kerbs cycle

C. Respiratory chain

D. Oxidative decarboxylation

Answer: C



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64. As compared to anaerobic respiration, the energy released during aerobic respiration is:

- A. 8times
- B. 12 times
- C. 18 times
- D. 36 times

Answer: C



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65. Substrate level phosphorylation occurs when:

A. Succinic acid changes to fumaric acid

B. Fumaric acid change to malic acid

C. Succinyl CoA changes to succinic acid

D. Oxaloacetic acid changes to α ketoglutaric acid

Answer: C



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66. How many ATP molecules are formed during anaerobic respiration?

A. 2

B. 4

C. 6

D. 8

Answer: B



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67. Anaerobic respiration in animals produces:

A. CO_2 and H_2O

B. C_2H_5OH , CO_2

C. Lactic acid and H_2O

D. Pyruvic acid and H_2O

Answer: C



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68. Most of the energy in the cells is liberated by oxidation of carbohydrates when

A. Glucose is converted to alcohol and CO_2

B. Sugar is converted to pyruvic acid

C. Pyruvic acid is converted to CO_2 and H_2O

D. Pyruvic acid is converted to CoA

Answer: C



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69. Synthesis of ATP in mitochondria requires:

A. NADP

B. FMN

C. Oxygen

D. Pyruvic acid

Answer: C



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70. The six carbon containing acid formed in krebs cycle is:

- A. Oxaloacetic acid
- B. Citric acid
- C. Ketoglutaric acid
- D. Succinic acid

Answer: B



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71. In ETS, which is the cytochrome that reacts with oxygen

A. Cyt a

B. Cyt b

C. Cyt b_6

D. Cyt a_3

Answer: D



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72. The correct sequence in Krebs cycle is:

A. Isocitric acid \rightarrow Oxalosuccinic acid \rightarrow

α -Ketoglutaric acid

B. Oxalosuccinic acid \rightarrow Isocitric acid \rightarrow

α -Ketoglutaric acid

C. α -Ketoglutaric acid \rightarrow Isocitric acid

\rightarrow Oxalosuccinic acid

D. Isocitric acid \rightarrow α -Ketoglutaric acid

\rightarrow Oxalosuccinic acid

Answer: A



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73. One mole of glucose on metabolism liberates how many kilocalories of energy ?

A. 180

B. 80

C. 160

D. 380

Answer: D



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74. Which of the following plant parts can respire even in the absence of oxygen?

A. Seeds

B. Roots

C. Stems

D. Leaves

Answer: B



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75. How many molecules of $NADH_2$ reproduced when four molecules of phosphoglyceraldehyde are converted into four molecules of pyruvate?

A. 2

B. 4

C. 6

D. 8

Answer: B



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76. The net gain of ATP during glycolysis is:



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77. When one molecule of acetyl CoA enters Krebs cycle, how many molecules of CO_2 are

released?



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78. ____ is the electron transport substance which contains iron.



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79. The ultimate oxidising agent in aerobic respiration is_____.



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80. Number of NADH molecules formed from glucose during anaerobic respiration is_____.



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81. RQ value of fat and protein is less than one because they contain more_____.



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82. Number of NADH molecules formed from glucose during anaerobic respiration is_____.



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83. During glycolysis_____molecules of NADH are formed.



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84. Other name of glycolysis is_____pathway.



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85. Final electron acceptor in respiration is_____.



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86. The enzyme ATP synthase is located in_____.



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87. Acceptor molecule for Krebs cycle is_____.



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88. The substrate molecule for Krebs cycle is____.



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89. ATP formation by oxidation of substrates is called_____.



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90. The stage at which the rate of evolution of CO_2 is equal to the rate of consumption of CO_2 is called_____.



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91. ____ is the universal hydrogen acceptor.



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92. Enzymes of ___ are available in matrix of mitochondria.



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93. Respiratory quotient for glucose is_____.



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94. _____ fermentation is seen in muscle cells.



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95. _____ is the terminal electron carrier in respiratory chain.



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96. Aerobic respiration produces energy about _____ times than in anaerobic respiration.



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97. ATP formation by oxidation of substrates is called_____.



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98. Process of degradation of glucose to pyruvic acid.



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99. Enzyme complex responsible for alcoholic fermentation by yeast.



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100. Ratio between volume of CO_2 evolved to volume of O_2 consumed during respiration.



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101. The stage at which the rate of evolution of CO_2 is equal to the rate of consumption of CO_2 is called_____.



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102. Synthesis of glucose from non-carbohydrate sources.



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103. WRITE SHORT NOTES ON: Fermentation



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104. WRITE SHORT NOTES ON: Respiratory quotient



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105. WRITE SHORT NOTES ON: Glycolysis



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106. DISTINGUISH BETWEEN: Aerobic and anaerobic respiration



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107. DISTINGUISH BETWEEN: Anaerobic respiration and Fermentation



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108. DISTINGUISH BETWEEN: Photosynthesis and respiration



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109. DISTINGUISH BETWEEN: Photorespiration and respiration



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110. Give an account of glycolysis.



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111. Give an account of Krebs cycle.



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112. Explain oxidative phosphorylation.



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