



BIOLOGY

BOOKS - MBD

Respiration in Plants

Example

1. What are respiratory substrates? Name the most common respiratory substrate.



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2. Write generalized reaction of respiration.



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3. What are the two types of respiration?



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4. Depict the generalized equation of anaerobic respiration.



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5. Name the energy currency of cell.



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6. Why plants do not need respiratory organs?



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7. Name the structure through which exchange of gases take place in plants.



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8. Cell respiration is a biochemical process. Say Yes or No.



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9. What does ETS stand for? Where is it found?



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10. What do ATP and ADP stand for?



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11. How many high -energy phosphate molecules are formed from one glucose molecule?



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12. Name the enzyme oxysomes represent.



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13. Which is the raw material in cell respiration.



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14. What kind of enzymes are present in mitochondria?





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15. Give the role of ATPase.



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16. How many ATP molecules are net gained during Glycolysis?



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17. Why is no distinction made between ATP and GTP in calculating energy yield in cell respiration?



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18. Name the unit of oxidative phosphorylation.



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19. Give the location of enzymes of TCA-cycle.



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20. Give the full form of EMP-pathway.



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21. How many calories are produced by aerobic oxidation of 1 gm mole of glucose?



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22. Which organic compound acts as link between glycolysis and Krebs cycle?



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23. What are end-products of glycolysis?



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24. Name a few organisms which can survive in the absence of oxygen.



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25. What is fermentation?



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26. How is fermentation different from anaerobic respiration?



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27. Which pathway is common between anaerobic and aerobic respiration?



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28. What are the advantages of anaerobic respiration in living beings?



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29. In anaerobic respirationis evolved butis not used:



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30. Anaerobic respiration of yeast produces:

A. N_2

B. O_2

C. CO_2

D. H_2O

Answer:



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

A. Seeds

B. Roots

C. Stems

D. leaves

Answer:



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32. Write a note on respiratory quotient.



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33. What is RQ value for carbohydrates



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34. Define RQ. What is its value for fats?



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35. How many ATP molecules are net gained during Glycolysis?



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36. How many ATP molecules are consumed during glycolysis?



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37. How many molecules of ATP are directly formed during Krebs cycle from one glucose molecule.



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38. What is RQ value of proteins?



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39. RQ value will be more than one in case of

.....



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40. Fill in the blank

The complete oxidation of pyruvate by the stepwise removal of all the hydrogen atoms, leaving three molecules of



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41. Fill in the blank

Glycerol would enter the pathway after being converted to



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42. Fill in the blank

Respiratory quotient for glucose



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43. Fill in the blank

Tricarboxylic acid cycle is another name of

.....



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44. Fill in the blank

Coenzyme FAD removes H-atoms from



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45. True or False

Fermentation is conducted by all micro-organisms.



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46. True or False

End product of Krebs cycle is pyruvic acid.



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47. True or False

Terminal cytochrome of the respiratory chain is a_3 .



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48. True or False

Aerobic respiration produces energy about 18 times than in anaerobic respiration.



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49. True or False

R.Q. for malic acid is less than one.



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50. One word for the following statement:

The difference in proton concentration across the inner membrane of mitochondria.



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51. One word for the following statement:

A substance acting to receive electrons in an oxidation-reduction reaction.



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52. One word for the following statement:

The sum of gradients of mass and electric charge for an ion across a membrane.



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53. One word for the following statement:

Movement of electrons from substrate to oxygen through a respiratory chain.



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54. One word for the following statement:

Under a critical low intensity of light, photosynthesis and respiration are approximately equal and apparently there is no exchange of gases.



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55. Differentiate between respiration and combustion



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56. Differentiate between: Glycolysis and Krebs' cycle



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57. Differentiate :

Aerobic respiration and anaerobic respiration



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58. What are respiratory substrates? Name the most common respiratory substrate.



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59. Give the schematic representation of glycolysis?



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60. What are the main steps in aerobic respiration? Where does it take place?



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61. Give the schematic representation of an overall view of Krebs' cycle.



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62. Explain ETS.



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63. Differentiate :

Aerobic respiration and anaerobic respiration



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64. Distinguish between the following:
Glycolysis and Fermentation



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65. Distinguish between the following:
Glycolysis and Citric acid Cycle



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66. What are the assumptions made during the calculation of net gain of ATP?



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67. Discuss ‘The respiratory pathway is an amphibolic pathway.’



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68. Define RQ. What is its value for fats?





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69. What is oxidative phosphorylation?



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70. What is the significance of step-wise release of energy in respiration?



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71. Energy is released during the oxidation of compounds in respiration. How is this energy stored and released as and when it is needed?



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72. Explain the term "Energy Currency". Which substance acts as energy currency in plants and animals?



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73. Different substrates get oxidized during respiration. How does Respiratory Quotient(RQ) indicate which type of substrate i.e. carbohydrate, fat or protein is getting oxidized?

$$R. Q. = \frac{A}{B}$$

What do A and B stand for ?

What type of substrates have R.Q. of 1, < 1 or > 1?



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74. $F_0 - F_1$ particles participate in the synthesis of



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75. When does anaerobic respiration occur in man and yeast?



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76. Which of the following will release more energy on oxidation? Arrange them in ascending order.

1 gm of fat



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77. Which of the following will release more energy on oxidation? Arrange them in ascending order.

1 gm of protein





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78. Which of the following will release more energy on oxidation? Arrange them in ascending order.

1 gm of glucose



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79. Which of the following will release more energy on oxidation? Arrange them in

ascending order.

0.5 gm of protein + 0.5g of glucose.



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80. The product of aerobic glycolysis in skeletal muscle and anaerobic fermentation in yeast are respectivelyand.....



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81. If a person is feeling dizzy, glucose or fruit juice is given immediately but not a cheese sandwich, which might have more energy. Explain.



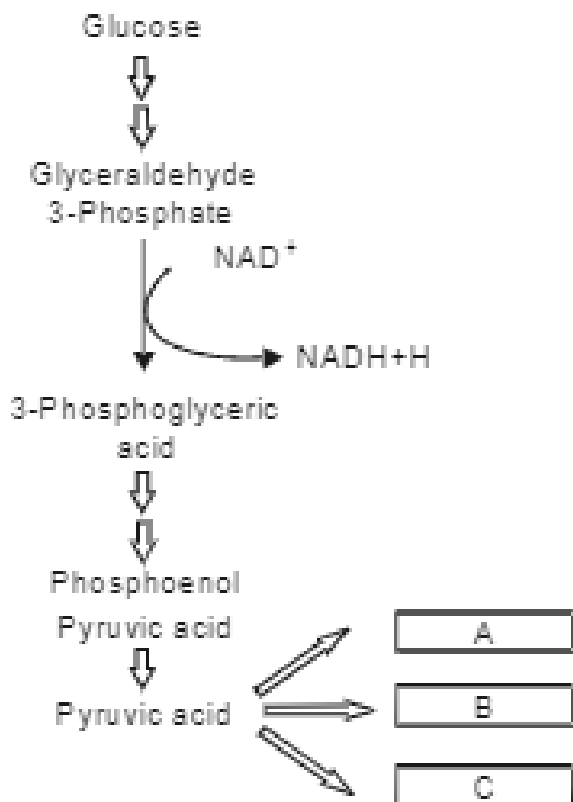
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82. What is meant by the statement "aerobic respiration is more efficient."?



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83. Pyruvic acid is the end product of glucolysis. What are the three metabolic fates of pyruvic acid under aerobic and anaerobic conditions? Write in the space provided in the diagram.





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84. Oxygen is an essential requirement for aerobic respiration but it enters the respiratory process at the end? Discuss.



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85. Respiration is an energy releasing and enzymatically controlled catabolic process which involves a step-wise oxidative

breakdown of organic substances inside living cells.

In this statement about respiration explain the meaning of

Step-wise oxidative breakdown



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86. Respiration is an energy releasing and enzymatically controlled catabolic process which involves a step-wise oxidative breakdown of organic substances inside living

cells.

In this statement about respiration explain the meaning of

Organic substances (used as substrates).



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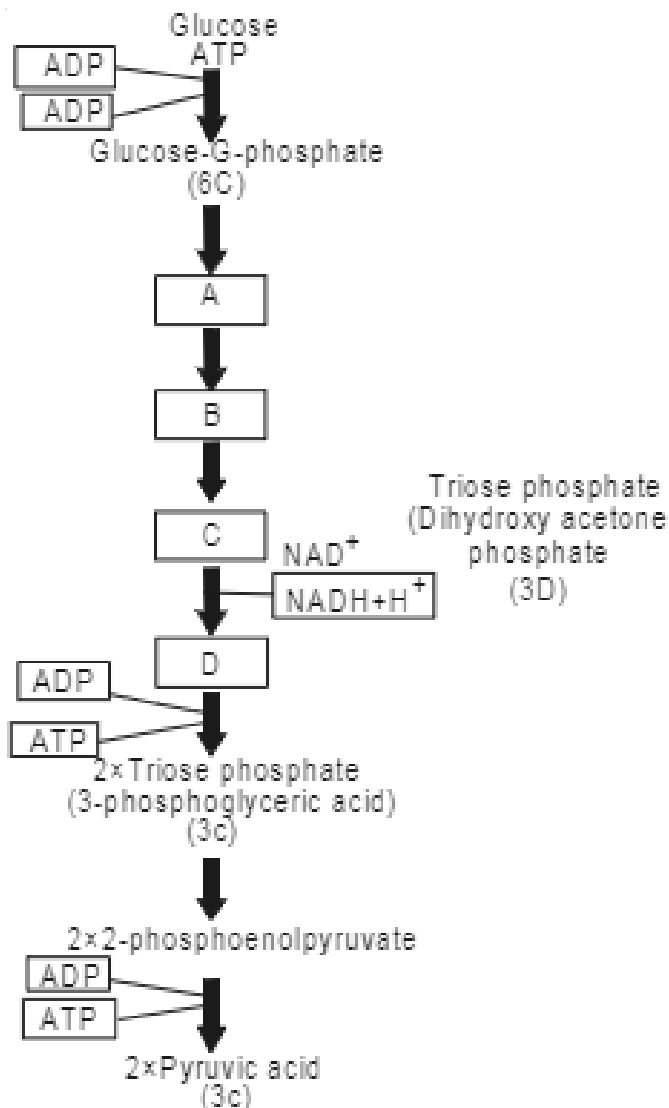
87. Comment on the statement- Respiration is an energy producing process but ATP is being used in some steps of the process.



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88. The figure given below shows the steps in glycolysis. Fill in the missing steps A, B, C, D and also indicate whether ATP is being used

up or released at step E?



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89. Discuss ‘The respiratory pathway is an amphibolic pathway.’



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90. We commonly call ATP as the energy currency of the cell. Can you think of some other energy carriers present in a cell? Name any two.



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91. Where does substrate level phosphorylation take place.



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92. In a way green plants and cyanobacteria have synthesized all the food on the earth.
Comment.



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93. The energy yield in terms of ATP is higher in aerobic respiration than during anaerobic respiration. Explain.



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94. RuBP carboxylase, PEPcase, Pyruvate dehydrogenase, ATP ase, Cytochrome oxidase, Hexokinase, Lactate dehydrogenase.

Select/ choose enzymes from the list above which are involved in :

Photosynthesis

Respiration

Both in photosynthesis and respiration.



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95. How does tree trunk exchange gases with the environment although it lacks stomata?



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96. Write two energy yielding reactions of glycolysis.



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97. Name the site(s) of pyruvate synthesis. Also, write the chemical reaction where in pyruvic acid dehydrogenase acts as a catalyst.



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98. Mention the important series of events of aerobic respiration that occur in the matrix of the mitochondrion as well as one that take place in inner membrane of the mitochondrion.



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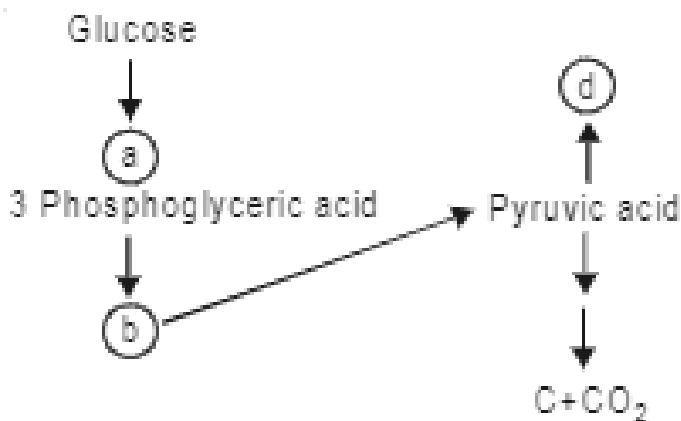
99. Respiratory pathway is believed to be a catabolic pathway. However, nature of TCA cycle is amphibolic. Explain.





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100. In the following flow chart, replace the symbols a, b, c and d with appropriate terms. Briefly explain the process and give any two applications of it.



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101. Oxygen is critical for aerobic respiration.

Explain its role with respect to ETS.



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102. Enumerate the assumptions that we undertake in making the respiratory balance sheet. Are these assumptions valid for a living system? Compare fermentation and aerobic respiration in this context.



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103. Give an account of Glycolysis. Where does it occur ? What are the end products? Trace the fate of these products in both aerobic and anaerobic respiration.



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104. Write the RQ value of

Fats



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105. Write the RQ value of

Proteins



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106. Write the RQ value of

Glucose



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107. Write the RQ value of

Oxalic acid.



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108. How much energy is released when terminal bond of ATP breaks down/



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109. What are energy transducers?



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110. Name the precise parts of cell which contain ATP.



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111. What is the name of triphosphate bonds of ATP?



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112. How many ATP molecules are produced by aerobic oxidation of pyruvic acid?



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113. Name the acid which gets accumulated in muscles by vigorous exercise.



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114. Name the intermediate between α - ketoglutaric acid and malic acid in P P P.



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115. Name two compounds formed before the formation of 6 phospho-gluconic acid in P P P.



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116. Write the full form of the following abbreviations.

FAD



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117. Write the full form of the following abbreviations.

NADP



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118. Write the full form of the following abbreviations.

NAD



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119. Write the full form of the following abbreviations.

FMN



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120. Write the full form of the following abbreviations.

PGAL



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121. Write the full form of the following abbreviations.

EMP



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122. Write the full form of the following abbreviations.

TCA



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123. Write the full form of the following abbreviations.

HMP-shunt.



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124. What are end-products of glycolysis?



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125. How many $NADH_2$ molecules are produced from one molecule of Acetyl CoA in TCAcycle?



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126. Name the final acceptor of electrons in ETC.



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127. By which process, the fatty acids change into Acetyl CoA?



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128. Name the intermediate between α - ketoglutaric acid and malic acid in P P P.



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129. What is respiration ? What are its two types?



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130. List advantages of R.Q.



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131. Briefly explain the steps involved in aerobic respiration .



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132. Write the significance of Citric acid cycle.



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133. Describe the process of pentose phosphate pathway.



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134. What happens to pyruvate produced during anaerobic respiration?



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135. What is oxidative phosphorylation?



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136. Give an account of Krebs's cycle.



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137. Depict an outline of pathways of anaerobic respiration.



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138. What is respiratory quotient Explain respiratory quotients of glucose , fats and proteins.



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139. Give reasons for following sequence.

With the help of enzyme dehydrogenase hydrogen is accepted by $NADP^+$.



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140. Give reasons for following sequence.

NAD helps in oxidation reduction reactions.



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141. Give reasons for following sequence.

In fats and proteins number of molecules of CO_2 released are less than number of oxygen molecules consumed.



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142. Give reasons for following sequence.

It is named after three German scientists i.e.

bEmbden, Meyrhof and Parnas.



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143. Give reasons for following sequence.

Anaerobic respiration forms lactic acid that

develops the sign of fatigue.



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Exercise

1. $F_0 - F_1$ particles participate in the synthesis of



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2. When does anaerobic respiration occur in man and yeast?



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3. Explain the term "Energy Currency". Which substance acts as energy currency in plants and animals?



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4. What is fermentation?



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5. Write the full form of the following abbreviations.

FAD



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6. Write full form of following abbreviations

FMN



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7. Write full form of following abbreviations

ATP



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8. Write full form of following abbreviations

PGAL



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9. Differentiate :

Aerobic respiration and anaerobic respiration



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10. What is RQ? Write RQ value of carbohydrates and fats?



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11. What is meant by the statement "aerobic respiration is more efficient."?



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12. Oxygen is an essential requirement for aerobic respiration but it enters the respiratory process at the end? Discuss.



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13. Give the schematic representation of glycolysis?



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14. Describe Lactic acid fermentation.



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15. Explain ETS.



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16. Discuss ‘The respiratory pathway is an amphibolic pathway.’



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17. Write schematic representation of Krebs cycle.



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