



## BIOLOGY

### BOOKS - CENGAGE BIOLOGY (ENGLISH)

#### RESPIRATION IN PLANTS

##### Exercises

1. RQ of proteins, carbohydrates, fats and organic acids are in order

A. 1

B. Less than 1

C. Greater than 1

D. Zero

**Answer: B**



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2. The value of RQ when the respiratory substance is poor in oxygen is

A. (a) Zero

B. (b) Infinity

C. (c) Greater than 1

D. (d) Less than 1

**Answer: D**



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**3.** The term protoplasmic respiration is used for the oxidation of

A. Fats

B. Proteins

C. Carbohydrates

D. Organic acids

**Answer: B**



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**4. Common step of both aerobic and anaerobic respiration are**

A. PPP

B. EMP

C. TCA cycle

D. ETS

**Answer: B**



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5. Anaerobic respiration in the presence of micro organisms is known

as

A. Pasteurization

B. Decay

C. Fermentation

D. Putrifaction

**Answer: C**



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**6. The term anaerobic respiration was coined by**

A. Kostlychev

B. Henry Beevers

C. Dickens

D. Cruickshank

**Answer: A**



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7. In anaerobic respiration, the number of ATP molecules produced are

A. 2 ATP

B. 6 ATP

C. 8 ATP

D. 1 ATP

**Answer: A**



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**8. The end products of fermentation are**

A.  $CO_2$

B.  $H_2O$

C. ATP



D. Alcohol

**Answer: C**



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**9. EMP pathway occurs in the**

A. Inner mitochondrial membrane

B. Cytoplasm

C. Mitochondrial matrix

D. Both (2) and (3)

**Answer: B**



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**10.** Which enzyme of glycolysis is also called as pacemaker enzyme ?

- A. Hexokinase
- B. Enolase
- C. Phosphofructokinase
- D. Pyruvate kinase

**Answer: C**



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**11.** The number of  $NADH_2$  molecules produced in EMP is

A. 1

B. 2

C. 3

D. 4

**Answer: B**



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**12. ETS in bacteria is found**

A. Cell wall

B. Plasma membrane

C. Nucleus

D. Cytoplasm

**Answer: B**



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13. The path of glucose breakdown to pyruvic acid was discovered by

A. Embden, Meyerhof, and Parnas

B. Warburg and Dicken

C. Sir Hans Krebs

D. Calvin

**Answer: A**



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14. ATP generated by  $1NADH_2$  and  $1FADH_2$  are respectively

A. 3,2

B. 2,3

C. 3,5

D. 5,3

**Answer: A**



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15. Which one of the following is the link between glycolysis and Krebs cycle?

A. Acetyl CoA

B. OAA

C. Pyruvic acid

D. Citric acid

**Answer: A**



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16. Primary acceptor of TCA cycle is

A. OAA

B. Acetyl CoA

C. Citric acid

D. Pyruvic acid

**Answer: A**



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17. In TCA cycle, how many reduced coenzymes are produced from one Acetyl CoA ?

A.  $3NADH_2$ ,  $1FADH_2$

B.  $2NADH_2$ ,  $1FADH_2$

C.  $4NADH_2$ ,  $2FADH_2$

D.  $5NADH_2$ ,  $1FADH_2$

**Answer: A**



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18. 5C intermediate molecule in TCA cycle is

- A. Citric acid
- B. Succinyl CoA
- C.  $\alpha$ -ketoglutaric acid
- D. Fumaric acid

**Answer: C**



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**19.** Number of total ATP generated in TCA cycle per Acetyl CoA molecule is

A. 10

B. 12

C. 14

D. 24

**Answer: B**



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20. One molecule of  $FADH_2$  upon oxidative phosphorylation yields

A. 2 ATP

B. 3 ATP

C. 4 ATP

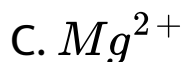
D. 5 ATP

**Answer: A**



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21. The element required for the activation of aconitase enzyme is



D. All of these

**Answer: A**



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22. A characteristic feature of ripening of some fruits (such as banana) is a sudden increase in respiration, which is known as

- A. Climatic
- B. Photorespiration
- C. Anthesis
- D. Climateric

**Answer: D**



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**23.** Substrate level phosphorylation in TCA occurs when

- A. Succinic acid changes to fumaric acid
- B. Fumaric acid changes to malic acid
- C. Succinyl CoA changes to succinic acid
- D. Oxalosuccinic acid changes to ketoglutaric acid

**Answer: C**



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24. Mineral activator needed for the enzyme isocitrate dehydrogenase of TCA cycle is

A. Fe

B. Mg

C. Mn

D. Cu

**Answer: A**



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25. One turn of Krebs' cycle produces

A.  $1FADH_2$ ,  $2NADH_2$  and 1 ATP

B.  $2FADH_2$ ,  $2NADH_2$  and 2 ATP

C.  $1FADH_2$ ,  $3NADH_2$ , and 1 ATP

D.  $1FADH_2$ ,  $1NADH_2$ , and 1 ATP

Answer: A



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26. Fumarase enzyme converts

- A. Succinic acid to malic acid
- B. Succinic acid to fumaric acid
- C. Fumaric acid to malic acid
- D. Fumaric acid to citric acid

**Answer: C**



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**27.** Electron Transport system (ETS) is located in mitochondrial

A. Cytoplasm

B. Mitochondrial matrix

C. Inner mitochondrial membrane

D. Outer mitochondrial membrane

**Answer: A**



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**28.** How many complexes are found in ETS in inner membrane of mitochondria ?

A. 3

B. 4

C. 5

D. 6

**Answer: A**



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**29.** The complex concerned with oxidative phosphorylation in inner mitochondrial membrane is

A. Complex IV

B. Complex V

C. Complex III

D. Complex II

**Answer: B**



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**30.** Mobile electron carrier in ETS in mitochondrial membrane is

A. PQ, PC

B. CoQ, Cyt c

C. PQ, Cyt c

D. PC, CoQ

**Answer: B**



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**31.** Proton channel of oxysome is located in

A.  $F_0$  of ATPase

B.  $F_1$  of ATPase

C. Cyt c

D. CoQ

**Answer: A**



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**32.** In prokaryotic cells, number of ATP generated from one glucose molecule is

A. 36

B. 38

C. 34

D. 32

**Answer: B**



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**33.** Inhibition of sugar breakdown due to the presence of  $O_2$  under anaerobic condition is called

A. Pasteur effect



B. Warberg effect

C. Gibbs effect

D. Kutusky effect

**Answer: A**



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**34.** Number of shuttles for transportation extra mimtochondrial  $NADH_2$  into mitochondrial is

A. 1

B. 2

C. 3

D. 0

**Answer: B**



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**35.** The first 5C dicarboxylic acid in Krebs' cycle which is used in nitrogen metabolism is

A. Succinic acid

B. Malic acid

C.  $\alpha$ -ketoglutaric acid

D. Citric acid

**Answer: C**



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**36.** According to the chemi-osmotic mechanism for ATP synthesis given by P. Mitchell, the force/factor responsible for ATP synthesis is

A. Membrane potential across membrane

B. Proton motive force

C. Electron motive force

D. Redox potential

**Answer: B**



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**37.** The intermediate common to fatty acid and carbohydrate oxidation is

A. Pyruvate

B. Acetyl CoA

C. Oxaloacetate

D. Succinate

**Answer: B**



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**38. Oxidation of palmitic and yield :**

A. 131

B. 129

C. 38

D. 142

**Answer: A**



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**39.**  $\beta$ -oxidation occurs in

A. Pea seeds

B. Gram seeds

C. Wheat grains

D. Cotton seeds

**Answer: D**



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**40.** Number of dehydrogenation in pentose phosphate pathways is

A. 2

B. 1

C. 3

D. 4

**Answer: A**



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**41. ATP cycle was given by**

A. Karl Lohman

B. Warburg and Lipman

C. Peter Mitchel

D. Fritz Lipman



**Answer: D**



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**42.** In cyanide-resistant respiration, the electrons are passed from ubiquinone to

A. Cyt b

B. Fe-S protein

C. Flavoprotein

D. FMN protein

**Answer: C**



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**43.** In PPP, the net gain of ATP molecules for one glucose molecule is

34 ATPs

35 ATPs

36 ATPs

38 ATPs

A. 34 ATPs

B. 35 ATPs

C. 36 ATPs

D. 38 ATPs

**Answer: B**



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**44.** A shunt to EMP or a safety valve is called

A. Pentose phosphate pathways

B. Cyanide resistance pathways

C. ED pathway

D. ETS

**Answer: A**



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**45. Which is not an important intermediate of PPP (HMS) ?**

A. *NADPH<sub>2</sub>*,

B. Erythrose 4phosphate

C. Ribulose

## D. Aromatic compounds

**Answer: D**



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**46.** First step of ethyl alcohol fermentation requires

A. Dehydrogenation

B. Decarboxylation

C. FMN

D.  $Zn^{2+}$

**Answer: B**



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**47. Hexose monophosphate shunt is**

A. Pentose phosphate pathway or a set of reactions that bypasses the glycolysis and Krebs cycle routes for glucose oxidation in the cell.

B. Conversion of glucose into pyruvic acid.

C. The sum of all chemical transformations.

D. The process by which starch is synthesized.

**Answer: A**



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**48. Efficiency of respiration is**

A. 45 %

B. 50 %

C. 90 %

D. 30 %

**Answer: A**



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**49. Cytochromes are**

A. Simple proteins

B. S-containing proteins



C. Conjugated proteins

D. Cu-containing proteins

**Answer: C**



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**50.** The most appropriate reason for storing green-colored apples at low temperature is

A. The rate of photosynthesis is reduced.

B. Respiration and photosynthesis are completely inhibited.

C. The rate of respiration is reduced.

D. The rate of photosynthesis and respiration are reduced.

**Answer: C**



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**51.** Respiratory Quotient (RQ) is defined as

A. Volume of  $O_2$ /Volume of  $CO_2$

B. Volume of  $CO_2$ / Volume of  $O_2$

C. Volume of  $O_2$ / Volume of  $N_2$

D. Volume of  $N_2$ /Volume of  $CO_2$

**Answer: B**



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**52. Pyruvic acid is formed during**

A. Krebs cycle

B. Glycolysis

C. Ornithine cycle

D. Calvin cycle

**Answer: B**



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**53.** The correct sequence of electron acceptor in ATP synthesis is

A. *cyt a, a<sub>3</sub>b, c*

B. cyt  $b, c, a, a_3$

C. cyt  $b, c_3, a, a_3$

D. cyt  $c, b, a, a_3$

**Answer: B**



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**54.** Which one of the following contains copper besides iron ?

A. Cytochrome -f

B. Cytochrome oxidase

C. Plastoquinone

D. Cytochrome -  $c_1$

**Answer: B**



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**55.** Where does the formation of acetyl CoA from pyruvic acid take place ?

A. Mitochondria

B. Chloroplast

C. Cytoplasm

D. Golgi body

**Answer: A**



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**56.** The number of ATP molecules produced by electron transport system from Krebs cycle intermediates in a single turn is

A. 11

B. 14

C. 12

D. 16

**Answer: A**



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**57.** In anaerobic respiration, the number of ATP molecules produced are

A. 1



B. 2

C. 3

D. 8

**Answer: B**



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**58.** In which of the following steps of Krebs cycle,  $CO_2$  is evolved ?

A. Isocitric acid  $\rightarrow$  Oxalosuccinic acid

B. Oxalosuccinic acid  $\rightarrow$   $\alpha$  -ketoglyutaric acid

C. Succinic acid  $\rightarrow$  Fumaric acid

D. Malic acid  $\rightarrow$  Oxaloacetic acid

**Answer: B**



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**59.** Which of the following enzymes is not used in Krebs cycle ?

A. Aconitase

B. Decarboxylase

C. Aldoase

D. Fumarase

**Answer: C**



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**60.** The end product of fermentation is

A.  $O_2$

B.  $N_2O$

C.  $H_2O$

D.  $C_2H_5OH$

**Answer: D**



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**61.** Gluconeogenesis is the

A. Formation of glucose from other than carbohydrate

B. Formation of glycogen

C. Breakdown of glucose

D. Formation of ammonia from glucose

**Answer: A**



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**62.**  $\beta$ -oxidation takes place in

A. Matrix of mitochondria

B. Cell cytoplasm

C. Inter mitochondrial chamber

D. Ribosomes

**Answer: C**



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**63.** In TCA cycle, the conversion of succinyl CoA to succinic acid requires

A. Acetyl CoA + GTP + iP

B. Acetyl CoA + GDP + iP

C. CoA + GTP + iP

D. GDP + iP

**Answer: D**



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**64.** Yeast is used in preparation of

A. Ammonia

B. Alcohol

C. Curd

D. Petrol

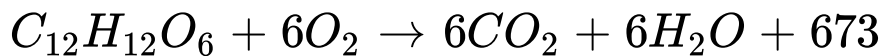
Answer: B



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65. Fermentation is represented by the equation

A.

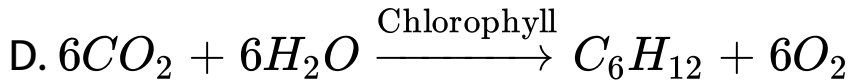
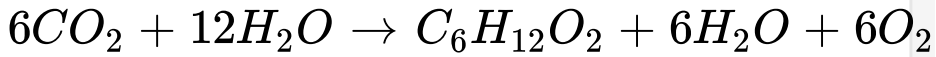


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C.



**Answer: B**



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**66.** Which of the following is formed during respiration ?

A.  $O_2$  (oxygen)

B.  $CO_2$  (carbon dioxide)

C.  $NO_2$  (nitrogen dioxide)

D.  $SO_2$  (sulfur dioxide)

**Answer: B**



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**67.** The pyruvic acid formed during glycolysis is oxidised to  $CO_2$  and  $H_2O$  in a cycle called

A. Calvin cycle

B. Hill reaction

C. Krebs's Cycle

D. Vitamins

**Answer: C**



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**68.** The end product of glycolysis is

A. Glucose

B. Fructose

C. Pyruvic acid

D. Ethyl alcohol

**Answer: C**



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**69.** Which of these has R.Q. value more than one ?

A. Fat

B. Fructose

C. Glucose

D. Organic acid

**Answer: D**



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**70.** One turn of Krebs' cycle produces

A.  $3FADH_2$ ,  $2NADH_2$ ,  $1ATP$

B.  $2FADH_2$ ,  $2NADH_2$ ,  $2ATP$

C.  $2NADH_2$ ,  $1FADH_2$ ,  $2ATP$

D.  $3NADH_2$ ,  $1FADH_2$ ,  $1ATP$

**Answer: D**



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**71.** How many ATP will be produced during the production of 1 molecule of acetyl CoA from 1 molecule of pyruvic acid ?

A. 3 ATP

B. 5 ATP

C. 8 ATP

D. 38 ATP

**Answer: A**



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**72.** The sequence of cytochromes is

A. Cyt, a, b, c,  $a_3$

B. Cyt, b, c, a,  $a_3$

C. Cyt b, a,  $a_3$ , c

D. Cyt b, c,  $a_3$ , a

**Answer: B**



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**73.** Cytochrome is a

- A. Mg pyrrole ring
- B. Hemoprotein
- C. Fe porphyrin ring
- D. Alloy of nichrome

**Answer: B**





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74. Where does krebs cycle take place?

A. Mitochondrial matrix

B. Cytoplasm

C. Lysosome

D. Nucleus

**Answer: A**



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**75.** Cellular respiration occurs in

- A. Chloroplast
- B. Golgi bodies
- C. Mitochondria
- D. Nucleus

**Answer: C**



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76. If volume of  $CO_2$  liberated during respiration is more than the volume of  $O_2$  used, then the respiratory substrate will be

- A. Fat
- B. Sucrose
- C. Glucose
- D. Organic acid

**Answer: C**



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77. Krebs cycle begins with reaction

- A. Citric acid + Acetyl CoA
- B. Oxaloacetic acid + Pyruvic acid
- C. Oxaloacetic acid + Citric acid
- D. Oxaloacetate + Acetyl CoA

**Answer: D**



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78. Hydrolysis of fat yields

A. Fatty acids

B. Fatty acids and glycerol

C. Mannose and glycerol

D. Maltose and fatty acid

**Answer: B**



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**79.** The respiratory quotient (R. Q.) is less than one in:

A. Carbohydrate

B. Fats

C. Organic acid

D. Sugar

**Answer: B**



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**80.** The richest energy compound is

A. Creatinine phosphate

B. Protein

C. Carbohydrate

D. Fat

**Answer: D**



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**81.** The stage up to which glycolysis and fermentation is common is

A. Dihydroxyacetone

B. 3-Phosphoglyceraldehyde

C. Pyruvate

D. Glucose-6-phosphate

**Answer: C**



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**82.** The respiratory quotient of carbohydrate is

A. Unity

B. Greater than unity



C. Less than unity

D. Equal to five

**Answer: A**



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**83.** In the conversion of pyruvic acid to acetyl coenzyme A, pyruvic acid is :

A. Oxidized

B. Reduced

C. Isomerized

D. Condensed

**Answer: A**



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**84.** In Krebs cycle,

A. ADP is converted into  $CO_2$

B. Pyruvic acid is converted into  $CO_2$  and

$H_2O$

C. Glucose is converted into  $CO_2$

D. Pyruvic acid is converted into ATP

**Answer: B**



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**85.** End product of anaerobic respiration is

A. Glucose and  $CO_2$

B. Alcohol and  $CO_2$

C. Water and  $CO_2$

D. Fructose and water

**Answer: B**



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**86.** What is the significance of Krebs cycle or citric acid cycle?

A. Synthesis of ATP

B. Synthesis of amino acid

C. Synthesis of chloropyll

D. All of the above

**Answer: D**



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**87.** In plants, respiration takes place

A. During day only

B. During night only

C. All 24 hours

D. At dusk

**Answer: C**



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**88.** Glycolysis takes place in

A. Cytoplasm

B. Nucleus

C. Plastid

D. Mitochondria

**Answer: A**



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**89.** Most of the energy harvested during aerobic respiration is produced / the greatest number of ATP molecules are produced from ADP, by

- A. Anaerobic respiration
- B. Krebs cycle
- C. Glycolysis
- D. None of the above

**Answer: B**





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90. Which of the following is not an intermediate in Krebs cycle ?

- A. Acetic acid
- B. Succinyl coenzyme-A
- C. Malic acid
- D. Citric acid

**Answer: A**



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**91.** Alcoholic fermentation takes place in the presence of

A. Maltase

B. Zymase

C. Amylase

D. Invertase

**Answer: B**



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92. EMP pathway occurs in the

A. Peroxisome

B. Cytoplasm

C. Matrix of mitochondria

D. Inner membrane of mitochondria

**Answer: B**



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93. The steps of respiration are controlled by

A. Substrates

B. Enzymes

C. Hormone

D. Bile juice

**Answer: B**



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**94.** The enzymes for electron transport chain are present

A. Inner mitochondrial membrane

B. Matrix

C. Intermembranous space

D. Endoplasmic reticulum

**Answer: B**



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**95.** Which of the following is common to glycolysis and Krebs' cycle ?

A. Acetyl CoA

B. Ribozyme

C. Cytochrome oxidase

D. N-acetyl glucosamine

**Answer: A**



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**96.** Pyruvic acid is the end product of

A. Krebs cycle

B. Electron transport system

C. Photosynthesis

D. Glycolysis

**Answer: D**



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**97.** Which of the following accepts terminal electron during aerobic respiration ?

A. Molecular  $O_2$

B. Molecular  $H_2$

C. Molecular  $CO_2$

D.  $NADPH_2$

**Answer: A**



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**98.** Glycolysis occurs in

A. Cytoplasm

B. Nucleus

C. Mitochondria

D. Both (1) and (3)

**Answer: A**



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**99.** Which one of the following is the first step glycolysis ?

A. Breakdown of glucose

B. Phosphorylation of glucose



C. Conversion of glucose into fructose

D. Dehydrogenation of glucose

**Answer: B**



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**100.** How many ATP molecules are released when 1 molecule of glucose is oxidized in our liver cells ?

A. 36

B. 38

C. 2

D. 8

**Answer: B**



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**101.** During prolonged fasting, in what sequence are the following organic compounds used up by the body?

A. Carbohydrates → Fats → Proteins

B. Carbohydrates → Proteins → Fats

C. Proteins → Fats → Carbohydrates

D. Fats → proteins → Carbohydrates

**Answer: A**



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**102.** How many ATPs are produced during the glycolysis of one molecule of glucose ?

A. 4

B. 2

C. 36

D. 38

**Answer: B**



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**103.** The final electron acceptor of the electron transport chain that functions in oxidative phosphorylation is :

A. NAD

B. FAD

C. Oxygen

D. Hydrogen

**Answer: C**



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**104.** Respiratory cycle where  $NADPH_2$  are produced is

A. Calvin cycle

B. Krebs's cycle

C. EMP pathway

D. HMP shunt

**Answer: C**



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**105.** In a eukaryotic cell, most of the enzymes of the Krebs cycle are located in the

A. Matrix of mitochondria

B. Inner membrane of mitochondria

C. Outer membrane of mitochondria

D. Stroma of chloroplast

**Answer: A**



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**106.** Which one of the following is the link between glycolysis and Krebs cycle?

A. Acetyl CoA

B. CoQ

C. Coenzyme

D. CoA

**Answer: A**



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**107.** The process of oxidative phosphorylation takes place in

A. Mitochondria

B. Chloroplasts



C. Ribosomes

D. Cytoplasm

**Answer: A**



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**108.** Glycolysis is : -

A. Glucose to glycogen

B. Glycogen to glucose

C. Glucose to pyruvic and

D. Glucose to citric acid

**Answer: C**



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**109.** Anaerobic respiration takes place in

A. Ribosome

B. Nucleus

C. Cytoplasm

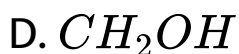
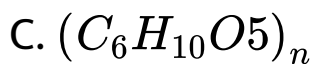
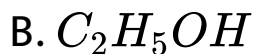
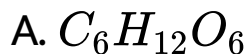
D. Vacuole

**Answer: C**



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**110.** Which of the following is the product of glucose fermentation by yeast ?



**Answer: B**



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**11. Answer the following questions :**

What is fermentation ?

- A. Anaerobic respiration
- B. Incomplete oxidation
- C. Excretory process
- D. None of the above

**Answer: B**



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**112.** The process of oxidative phosphorylation takes place in

- A. Chloroplast
- B. Ribosomes
- C. Mitrochondria
- D. Endoplasmic reticulum

**Answer: C**



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**113.** In which of the following , respiration in the absence of oxygen also takes place ?

A. Man

B. Potato

C. Yeast

D. Spirogyra

**Answer: C**



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**114.**  $CO_2$  is liberated during

- A. Ascent of sap
- B. Respiration
- C. Photosynthesis
- D. Transpiration

**Answer: B**



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**115.** ATP stands for which of the following ?

- A. Adenine tetraphosphate
- B. Adenine triphosphate
- C. Adenosine diphosphate
- D. Adenosine triphosphate

**Answer: C**



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**116.** Glycolysis occurs in

A. Vacuoles

B. Nucleolus

C. Mitochondria

D. Cytoplasm

**Answer: D**



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**117.** How many ATP will be produced during the production of 1 molecule of acetyl CoA from 1 molecule of pyruvic acid ?

A. 3 ATP

B. 8 ATP

C. 36 ATP

D. 38 ATP

**Answer: A**



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**118.** The energy produced by one ATP molecule is

A. 7.6 kcal

B. 12 kcal

C. 20 kcal

D. 10 kcal

**Answer: A**



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**119.** Which of the following show anaerobic respiration ?

A. Earthworms

B. Rabbit

C. Echinderms

D. Tapeworms

**Answer: D**



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**120.** The first organisms are believed to be

A. Autotrophs

B. Mixturophs

C. Chemoautotrophs

D. Heterotrophs

**Answer: C**



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**121.** Pyruvic acid before combining with the oxaloacetic acid of Krebs cycle becomes

- A. Citric acid
- B. Acetoacetic acid
- C. Cis-aconitic acid
- D. Acetyl CoA

**Answer: D**



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**122.** Anaerobic respiration takes place in

A. Ribosome

B. Nucleus

C. Cytoplasm

D. Vacuole

**Answer: C**



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**123.** The energy currency of a cell

A. DNA

B. RNA

C. ATP

D. Minerals

**Answer: C**



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**124.** The process of oxidative phosphorylation takes place in



A. Mitochondria

B. Chloroplasts

C. Ribosomes

D. Cytoplasm

**Answer: A**



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**125. RQ of which diet is less than unity ?**

A. Carbohydrate

B. Fats

C. Organic acid

D. Sugar

**Answer: B**



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**126.** Pyruvic acid is the end product of which process ?

A. Krebs cycle

B. Calvin cycle

C. Pentose phosphate pathway

D. Glycolysis

**Answer: D**



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**127.** 1 molecule glucose, 6 molecules of  $O_2$  and 38 ADP combine to form  $6H_2O$ ,  $6CO_2$ , and

A. 38 molecules of ATP

B. 28 ATP

C. 38 ADP

D. 28 ADP

**Answer: A**



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**128.** The number of ATP obtained at the end of  
Krebs cycle

A. 2 ATP

B. 4 ATP

C. 8 ATP

D. 38 ATP

**Answer: D**



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**129.** As compared to anaerobic respiration the energy gained during aerobic respiration is

A. 2

B. 8

C. 9

D. 18

**Answer: C**



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**130.** Respiration is

A. Catabolic

B. Metabolic

C. Anabolic

D. None

**Answer: A**



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**131. RQ is**

A.  $O_2 / CO_2$

B.  $CO_2 / O_2$

C.  $V_2 / (V_2 - V)$

D.  $O_2$  taken in

**Answer: B**



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**132.** Which is the site of Krebs cycle ?

A. Chloroplast

B. Golgi body

C. Mitochondria

D. Endoplasmic reticulum



**Answer: C**



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**133.** Succinyl Co-A is related to

- A. Krebs cycle
- B. Calvin cycle
- C. Glycolate cycle
- D. HMP-cycle

**Answer: A**



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**134.** According to chemiosmotic of P. Mitchell (1978), ATPs are synthesised on membranes due to the

- A. Proton gradient
- B. Electron gradient
- C. Osmosis
- D. From  $H_2SO_4$

**Answer: A**





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135.  $NADP^+$  is reduced to NADPH in

A. ETS-pathway

B. HMP-shunt

C. Calvin cycle

D. Glycolysis

**Answer: B**



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**136.** Cut surface of fruits and vegetables often become dark because

- A. Dirty knife makes it dark
- B. Oxidation of acid in the presence of trace of iron from the knife makes it dark
- C. Dust of the air makes it dark
- D. None of the above

**Answer: B**



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**137.** The element required for the activation of aconitase enzyme is

A. Mn

B. Fe

C. Mg

D. Cu

**Answer: B**



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**138.** An example of competitive inhibition of an enzyme is the inhibition of

- A. Succinic dehydrogenase by malonic acid
- B. Cytochrome oxidase by cyanide
- C. Hexokinase by glucose-6 phosphate
- D. Carbonic anhydrase by carbon dioxide

**Answer: A**



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**139.** At a temperature above  $35^{\circ}C$

- A. Rate of decline of respiration will be earlier than decline of photosynthesis
- B. Rate of decline of photosynthesis will be earlier than decline of respiration
- C. Both decline simultaneously
- D. Both do not show any fixed pattern

**Answer: A**



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140. In hexose monophosphate shunt the number of  $CO_2$  molecules evolved is

- A. Same as in glycolysis
- B. Less than glycolysis
- C. More than glycolysis
- D. Much less than glycolysis

**Answer: B**



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**141.** Conversion of pyruvic acid into ethyl alcohol is mediated by

- A. Phosphatase
- B. Dehydrogenase
- C. Decarboxylase and dehydrogenase
- D. Catalase

**Answer: B**



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142. The commonest living, which can respire in the absence of  $O_2$  is

A. Fish

B. Yeast

C. Potato

D. Chlorella

**Answer: B**



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**143.** In the formation of Acetyl Co-A from pyruvic acid in mitochondria, pyruvic acid gets

A. Reduction

B. Dehydration

C. Phosphorylation

D. Oxidative decarboxylation

**Answer: D**



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144. Which of the following is link between carbohydrate and fat metabolism ?

A.  $CO_2$

B. Acetyl Co-A

C. Pyruvic acid

D. Citric acid

**Answer: B**



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**145.** Pyruvate dehydrogenase complex is usedc  
in converting

- A. Pyruvate to glucose
- B. Glucose to pyruvate
- C. Pyruvic acid to lactic acid
- D. Pyruvate to acetyl Co-A

**Answer: D**



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**146.** The first compound of TCA cycle is

A. Oxalo succini acid

B. Oxalo acetic acid

C. Citric acid

D. Cis aconitic acid

**Answer: C**



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**147.** Which of the following is coenzyme -II ?

A. NAD

B. NADP

C. FAD

D. None of the above

**Answer: B**



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**148.** Where does the synthesis of enzyme occur in a cell

- A. Inside the nucleus
- B. In lysosomes
- C. On the surface of ribosome
- D. Inside the vacuole

**Answer: C**



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**149.** Excess of ATP inhibits the enzyme

- A. Phosphofroctokinase



B. Hexokinase

C. Aldolase (Lyases)

D. Pyruvate decarboxylase

**Answer: A**



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**150.** End product of glycolysis is

A. Citric acid

B. Glyceraldehyde

C. Phosphoglyceraldehyde

D. Pyruvic acid

**Answer: D**



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**151.** First reaction in pentose phosphate pathway is

A. Oxidation of glucose-6-phosphate

B. 6-phosphogluconic acid

C. Ribose-5-phosphate

D. Fructose-5-phosphate

**Answer: A**



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**152.** Oxidation of one molecule of glucose yields 38 mols of ATP in the proportion of

A. 36 ATP molecules

B. 38 ATP molecules

C. 3 ATP molecules

D. 15 ATP molecules

**Answer: B**



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**153.** During the formation of bread, it becomes porous due to release of  $CO_2$  by the action of

A. Yest

B. Bacterial

C. Virus

D. Protozoans

**Answer: A**



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**154.** How many ATP molecules will be produced in muscles by aerobic oxidation of one molecule of glucose ?

A. 2

B. 4

C. 38

D. 34

**Answer: C**



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**155.** Two names refer to one and the same thing

A. Krebs cycle and Calvin cycle

B. Tricarboxylic acid cycle and citric acid cycle

C. Citric acid cycle and Calvin cycle

## D. Tricarboxylic acid cycle and urea cycle

**Answer: B**



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**156.** In alcohol fermentation : -

A. Triosephosphate is the electron donor,  
while acetaldehyde is the electron acceptor.

B. Triosephosphate is the electron donor,  
while pyruvic acid is the electron acceptor.

C. There is no electron donor.

D. Oxygen is the electron acceptor.

**Answer: A**



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**157.** In glycolysis, during oxidation, electron's are removed by

A. Molecular oxygen

B. ATP



C. Glyceraldehyde

D.  $NAD^+$

**Answer: D**



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**158.** For retting of jute, the fermenting microbe is

A. *Helicobacter pylori*

B. Methanophilic bacteria

C. Streptococcus lacin

D. Butyric acid bacteria

**Answer: D**



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**159.** Most of the energy harvested during aerobic respiration is produced / the greatest number of ATP molecules are produced from ADP, by

A. Conversion of pyruvic acid to acetyl CoA

B. Electron transport chain

C. Glycolysis

D. Krebs cycle

**Answer: B**



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**160.** The deficiencies of micronutrients, not only affects growth of plants but also vital functions such as photosynthetic and mitochondrial electron flow. Among the list given below, which

group of three elements shall affect most, both photosynthetic and mitochondrial electron transport -

A. Cu, Mn Fe

B. Co, Ni, Mo

C. Mn Co, Ca

D. Ca, K, Na

**Answer: A**



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**161.** Chemiosmotic theory of ATP synthesis in chloroplast & mitochondria is based on

- A. Proton gradient
- B. Accumulation of K ions
- C. Accumulation of Na ions
- D. Membrane potential

**Answer: A**



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**162.** Curing of tea leaves is brought about by the activity of-

A. Viruses

B. Fungi

C. Bacteria

D. Mycorrhiza

**Answer: C**



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**163.** Which of the following statements regarding mitochondrial membrane is not correct ?

A. The inner membrane is highly convoluted forming a series of infolding.

B. The outer membrane resembles a sieve.

C. The outer membrane is permeable to all kinds of molecules.

D. The enzymes of the electron transfer chain are embedded in the outer membrane.

**Answer: D**



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**164.** How many ATP molecules could maximally be generated from one molecule of glucose, if the complete oxidation of one mole of glucose to  $CO_2$  and  $H_2O$  yields 686 kcal and the useful chemical energy available in the high energy phosphate bond of one mole of ATP is 12 Kcal?

A. 57

B. 3



C. 2

D. 30

**Answer: A**



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## Assertion Reasoning Questions

1. A : 2, 4 DNP is an uncoupling agent of ETS.

R. It is soluble in lipids.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true, but the Reason is not the correct explanation of the Assertion.

C. If Assertion is true, but Reason is false.

D. If both Assertion and Reason are false.

**Answer: B**



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2. Assertion :- Glucose 6-phosphate dehydrogenase deficiency impairs PPP (HMS).

Reason :- It is an X-linked recessive disorder.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true, but the Reason is not the correct explanation of the Assertion.

C. If Assertion is true, but Reason is false.

D. If both Assertion and Reason are false.

**Answer: B**



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**3. A :** RQ of maturing fatty seeds is  $> 1$ .

**R :** Fats are preferred energy fuels.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true, but the Reason is not the correct explanation of the Assertion.

C. If Assertion is true, but Reason is false.

D. If both Assertion and Reason are false.

**Answer: C**



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4. Assertion :- In cellular respiration, ETS electron movement is a downhill journey.

Reason :- Electrons move from high redox potential to low redox potential to low redox potential.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true, but the Reason is not the correct explanation of the Assertion.

C. If Assertion is false, but Reason is true

D. If both Assertion and Reason are false.

**Answer: A**



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**5. A :** Succinyl CoA is the precursor of pyrrole group containing compounds.

**R :** Succinyl CoA is the precursor of pyrrole group containing compounds.

**A.** If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true, but the Reason is not the correct explanation of the Assertion.

C. If Assertion is true, but Reason is false.

D. If both Assertion and Reason are false.

**Answer: B**



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**Archives**



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

A. Nucleic acids

B. ATP in small stepwise units

C. ATP in one large oxidation reaction

D. Sugars

**Answer: B**



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2. All enzymes of TCA cycle are located in the mitochondrial matrix except one which is located in inner mitochondrial membranes in eukaryotes and in cytosol in prokaryotes. This enzyme is

A. Succinate dehydrogenase

B. Lactate dehydrogenase

C. Isocitrate dehydrogenase

D. Malate dehydrogenase

**Answer: A**





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3. Which one of the following mammalian cells is not capable of metabolizing glucose to carbon-dioxide aerobically ?



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4. Which one of the following is the competitive inhibitor of succinic dehydrogenase, which participates in Krebs's cycle?

A.  $\mu$ -ketoglutarate

B. Malate

C. Malonate

D. Oxalocetate

**Answer: C**



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5. The chemiosmotic coupling hypothesis of oxidative phosphorylation process 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 towards 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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6. In germinating seeds fatty acids are degraded exclusively in the

- A. Peroxisomes
- B. Mitochondria
- C. Proplastids
- D. Glyoxysomes

**Answer: D**



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7. Aerobic respiratory pathway is appropriately termed

A. Anabolic

B. Catabolic

C. Parabolic

D. Amphibolic

**Answer: D**



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8. The energy releasing metabolic process in which substrate is oxidised without an external electron acceptor is called

A. Aerobic respiration

B. Glycolysis

C. Fermentation

D. Photorespiration

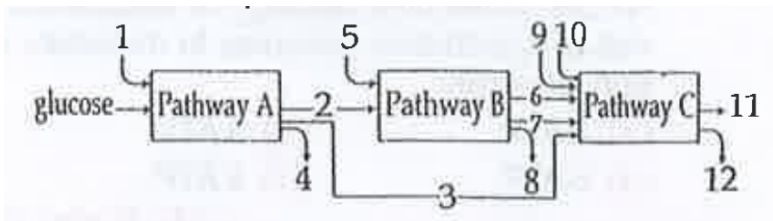
**Answer: C**



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9. The three boxes in this diagram represent the three major biosynthetic pathways in aerobic respiration. Arrows represent net reactants or products.



Arrows numbered 4, 8 and 12 can all be

A. NADH

B. ATP

C.  $H_2O$

D.  $FAD^+$  or  $FADH_2$

**Answer: B**



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**10.** Which of the metabolites is common to respiration-mediated breakdown of fats, carbohydrates and proteins?

- A. Glucose-6-phosphate
- B. Fructose 1,6-bisphosphate
- C. Pyruvic acid
- D. Acetyl CoA

**Answer: D**



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**11.** In which one of the following processes  $CO_2$  is not released?

- A. Aerobic respiration in plants
- B. Aerobic respiration in animals
- C. Alcoholic fermentation
- D. Lactate fermentation

**Answer: D**



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**12. Chromatophores taken part in**

A. Respiration

B. Photosynthesis

C. Growth

D. Movement

**Answer: B**



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