BIOLOGY

BOOKS - DINESH PUBLICATION ENGLISH

RESPIRATION

Multiple Choice Questions

1. Respiration converts potential or stored energy of food into

A. Chemical energy

B. Mechanical energy

C. Kinetic energy

D. All forms of energy

Answer: A

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2. Cellular respiration is

A. Continuous

B. Intermittent

C. Performed at intervals

D. Held when energy is required

Answer: A

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3. The term respiration was given by

A. Lavosier

B. Dutrochet

C. Sachs

D. Krebs

Answer: B

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4. Respiration is

A. Anabolic and exergonic

B. Anabolic acid endergonic

C. Catabolic and exergonic

D. Catabolic and endergonic

Answer: C

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5. Who is credited with study of external respiration for the first time

A. Dutrochet

B. Pasteur

C. Cruickashank

D. Lavosier.

Answer: D

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6. External respiration is

A. Respiration in skin cells

B. Gaseous exchange between organism and external environment

C. Gaseous exchange between cells and tissue fluid

D. Both B and C

Answer: B

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7. Tissue respiration denotes

A. Respiration denotes

B. Gaseous exchange between cell and tissue fluid

C. Cell respiration

D. Both B and C

Answer: D

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8. Usable energy available from respiration is

A. 0.1

B. 0.3

C. 0.4

D. 0.5

Answer: D

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9. Ussable energy of respiration is

A. Immediately consumed in cellular activities

B. Trapped in ATP molecules

C. Stored as heat

D. Used in charging biomolecules into activity

Answer: B

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10. In respiration, the energy not captured by ATP is

A. Transferred to organic compounds

B. Converted into heat

C. Liberated alongwith CO_2

D. Transferred to water.

Answer: B

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11. Net rate of respiration is higher than that of photosynthesis. The plant will

A. Not die

B. Die of starvation

C. continue to live but not grow

D. Show better growth due to greater availability of energy.

Answer: B

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12. The difference between respiration and combustion is related to respiration being

A. Multistep

B. Enzyme controlled

C. Intracellular

D. All the above

Answer: D

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13. Dark respiration is

A. Cellular respiration

B. Found in deeper tissues and roots

C. Found only during night

D. Both B and C

Answer: A

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14. Caloric value of 9.5 kacal/gm is found in case of

A. Carbohydrates

B. Fats

C. Proteins

D. Vitamins

Answer: B

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

A. Glucose

B. Sucrose

C. Maltose

D. Glycogen

Answer: A

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16. Floating respiration is respiration

A. Occurring in cytosol

B. Using carbohydrate as substrate

C. Employing fat as respiratory substrate

D. Both B and C

Answer: D

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17. Protoplasmic respiration is respiration

A. Occurring in protoplasm

B. Controlled by genetic factors

C. Occurring outside the mitochondira

D. Employing proteins as respiratory substrate.

Answer: D

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18. Biological oxidation of respiratory substrate causes

A. Gain of oxygen

B. Gain of hydrogen

C. Loss of oxygen

D. Loss of hydrogen.

Answer: D

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19. Which one yields the highest energy per gram

A. Carbohydrate

B. Protein

C. Fat

D. Amino acids.

Answer: C

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20. Which one provides twice as much energy as carbohydrates

A. Vitamins

B. Proteins

C. Minerals

D. Fats

Answer: D

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21. Energy released per gram would be

A. Highest when Wheat starch is respiratory substrate

B. Highest when Potato starch is respiratory substrate

C. Same in all the cases.

D. Highest when rice starch is respiratory substrate

Answer: D

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22. More energy is produced in aerobic respiration than anaerobic respiration because in anaerobic respiration

A. Food is incompletely oxidised

B. Very few enzymes are involved

C. Oxygen is not required

D. Alcohol is produced

Answer: A

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23. Aerobic respiration is more advantageous than anaerobic respiration because

A. It requires oxygen

B. It produces more energy

C. It causes complete break down of respiratory substrate

D. Aerobic respiration produces water.

Answer: B

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24. R.Q. stands for

A. Resistance coefficient

B. Replicase concentration

C. Respiratory quotient

D. Reticular concentration

Answer: C

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25. R.Q. indicates

A. Effect of temperature

B. Nature of respiratory substrate

C. Amount of water released

D. Type of alcohol formed.

Answer: B

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26. In respiration of substrate of organic acids, the R.Q. shall be

A. Unity

B. Less than one

C. Zero

D. More than one.

Answer: D

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27. Which one of the following has the highest R.Q.

A. Malic acid

B. Protein

C. Fat

D. Starch.

Answer: A

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28. R.Q. for protein is

A. 1.4

B. 0.5

C. 0.7-0.9

D. Unity.

Answer: C

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29. R.Q. is infinity. Respiration is

A. Aerobic, carbohydrate

B. Aerobic, fat

C. Aerobic, protein

D. Anaerobic, carbohydrate.

Answer: D

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30. Approximately how much Kcal energy is produced in biological oxidation per mole of oxygen reduced?

A. 114 kcal

B. 686 kcal

C. 256 kcal

D. 60 kcal

Answer: A

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31. Number of ATP formed per molecule of oxygen used in respiration is

A. 16

B. 8

C. 6

D. 4

Answer: C

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

A. Glycolysis and oxidative phosphorylation

B. Glycolysis and Krebs cycle

C. Glycolysis, Krebs cycle and terminal oxidation

D. Kerbs cycle and terminal oxidation.

Answer: C

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33. Types of aerobic respiration are

A. Glycolysis and HMP

B. Common pathway and HMP

C. Krebs cycle and PPP

D. Terminal oxidation and common pathway

Answer: B

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34. What is common in common pathway of aerobic respiration

A. Glycolysis in both aerobic and anaerobic respiration

B. Kerbs cycle common with HMP

C. Terminal oxidation in both aerobic and anaerobic respiration

D. Kerbs cycle in both aerobic and anaerobic respiration

Answer: A

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35. To start respiration, a living cell requires

A. Glucose

B. Glucose $+O_2$

C. O_2

D. Glucose $+ATP$

Answer: D

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36. For undergoing glycolysis, glucose requires priming with the help of ATP

A. 1

B. 2

C. 3

D. 4

Answer: B

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37. Most common mineral activator of glycolytic enzymes is

A. Fe

B. Zn

C. Mg

D. Mn

Answer: C

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

A. Glucose 1-phosphate

B. Glucose 6-phosphate

C. Glucose 1,6-biphosphate

D. Fructose, 1,6-biphosphate

Answer: B

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39. Number of oxygen molecules required for glycolytic breakdown of one glucose molecule is

A. Zero

B. Three

C. Six

D. Thirty eight

Answer: A

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40. Which one is removed from substrate during glycolysis

A. Hydrogen

B. Electrons

C. Both A and B

D. Oxygen

Answer: C

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41. Which one is inhibited if the cells contain excess of ATP

A. Krebs cycle

B. Glycolysis

C. Oxidative phosphorylation

D. Electron transport

Answer: B

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42. Which one of the following is wrong about glycolysis

A. It uses ATP

B. It produces ATP

C. End products are CO_2 and H_2

D. NADH (H^+) is produced

Answer: C

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43. Glycolysis

A. Mitochondira

B. Cytoplasm

C. E.R.

D. Ribosomes

Answer: B

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44. The intermediate of glycolysis which undergoes lysis or splitting is

A. Dihydroxyacetone 3-phosphate

B. Fructose 1, 6-diphosphate

C. Glyceraldehyde 3-phosphate

D. Glucose 6-phosphate.

Answer: B

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45. Phosphoglyceraldehyde and dihdroxy acetone phosphate are

A. Isomers

B. Polymers

C. Tautomers

D. Synonyms

Answer: A

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46. Substrate phosphorylation is the formation of

A. ATP

B. AMP

C. ADP

D. Pyruvic acid

Answer: A

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47. Which is formed alongwith ATP in glycolysis

A. NADH

B. NADPH

C. FAD

D. $FADH_2$

Answer: A

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48. Respiratory formation of ATP during the reactions 1,3-diphosphoglyceric acid $\rightarrow$ 3-phosphoglyceric acid and phosphenol pyruvate $\rightarrow$ Pyruvates is

A. Oxidative phosphorylation

B. Substrate level phosphorylation

C. Respiratory phosphorylation

D. Chemical phosphorylation

Answer: B

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49. Oxidation of glyceraldehyde phosphate is accompanied by

A. Oxidation of NAD^+

B. Substrate level phosphorylation

C. Reduction of NAD^+

D. Oxidative phosphorylation.

Answer: C

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50. Formation of phosphoenol pyruvate from 2-phosphoglycerate is

A. Dehydration

B. Dehydrogenation

C. Oxidation

D. Hydration.

Answer: A

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51. Who found out the steps involved in aerobic respiration

A. Krebs

B. Lipmann

C. Devlin

D. Kolliker.

Answer: A

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52. An amphibolic pathway is

A. TCA cycle

B. Calvin cycle

C. Terminal oxidation

D. Electron transport chain.

Answer: A

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

A. Reduced

B. Oxidised

C. Isomerised

D. Condensed

Answer: B

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54. Oxidation of pyruvate is accompanied by

A. Oxidation of NAD^+

B. Reduction of NAD^+

C. Oxidation of CoA

D. Reduction of CoA

Answer: B

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55. Coenzyme A helps in

A. Oxidative phosphorylation

B. Substrate level phosphorylation

C. Breakdown of pyruvate

D. Activation of acetyl group

Answer: D

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56. Number of carbon atoms present in citric acid, oxaloacetic acid and pyruvic acid are respectively

A. 6, 3 and 3

B. 6, 4 and 3

C. 5, 4 and 3

D. 6, 4 and 2

Answer: B

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57. Oxidation of pyruvate forms

A. Acetyl CoA

B. NADH

C. CO_2

D. All the above

Answer: D

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58. Removal of hydrogen and CO_2 from a substrate is called

A. Decarboxylation

B. Oxidation

C. Oxidative decarboxylation

D. Reductive decarboxylation.

Answer: C

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59. One molecule of pyruvic acid produces ________ molecules of CO_2 in mitochondrion

A. $2CO_2$

B. $3CO_2$

C. $4CO_2$

D. $6CO_2$

Answer: A

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60. Protons taking part in oxidative phosphorylation enter mitochondrion as

A. Glucose

B. Oxaloacetic acid

C. Acetyl CoA

D. Pyruvate

Answer: D

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61. Enzymes of Krebs cycle are present

A. Outer mitochondiral membrane

B. Inner mitochondiral membrane

C. Inter-membrane space

D. Mitochondrial matrix

Answer: D

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62. Inner mitochodrial membrane allows the passage of

A. Glucose

B. Pyruvate

C. NADH

D. Oxaloacetate

Answer: B

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63. Tricarboxylic acids of Kerbs cycle are

A. Succinic acid, Fumaric acid and Citric acid

B. Oxalosuccinic acid, Citric acid and α-ketoglutaric acid

C. Citric acid, Isocitric acid and Malic acid

D. Citric acid, Isocitric acid and Oxalosuccinic acid.

Answer: D

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64. Number of ATP molecules synthesised through substrate level phosphorylation during aerobic respiration of one glucose molecules is

A. 8

B. 6

C. 4

D. 2

Answer: B

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65. In aerobic respiration, first CO_2 is liberated during

A. Oxidation of pyruvate

B. Decarboxylation of oxalosuccinate

C. Decarboxylation of α-ketoglutarate

D. `Alcoholic fermentation

Answer: A

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66. A complex enzyme system of mitochondira functional outside Krebs cycle is

A. Pyruvate kinase

B. Pyruvate dehydrogenase

C. Enolase

D. α-Ketoglutrate dehydrogenase

Answer: B

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67. A complex enzyme system functional in Krebs cycle is

A. Citrate sysnthetase

B. Isocitrate dehydrogenase.

C. Oxalosuccinate decarboxylase

D. α-ketoglutarate dehydrogenase.

Answer: D

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68. Hydration reaction occurs in Krebs cycle during conversion of

A. Acetyl CoA to citric acid

B. α-ketoglutrate to succinyl CoA

C. Succinate to fumarate

D. Fumarate to malate

Answer: D

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69. Fats enter common pathway of respiration as

A. DiHAP and α-ketoglutrate

B. DiHAP and acetyl CoA

C. Glyeric acid and acetyl CoA

D. Glyceric acid and α-ketoglutarate.

Answer: B

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70. In Krebs cycle, malate hands over hydrogen to

A. NAD^{+}

B. FAD

C. FMN

D. Oxaloacetate

Answer: A

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71. In Krebs' cycle, the H^+ removed at succinate level is accepted by

A. NAD^+

B. FAD

C. FMN

D. Fumarate.

Answer: B

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72. Mineral activator of enzyme aconitase is

A. Mn

B. Mg

C. Fe

D. Cu.

Answer: C

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73. Terminal oxidation in ETC is

A. Synthesis of metabolic water

B. Electron transport

C. Oxidative phosphorylation

D. All the above

Answer: D

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74. Formation of ATP in respiration is called

A. Photophosphorylation

B. Substrate phosphorylation

C. Oxidative phosphorylation

D. Phosphorylation

Answer: C

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75. Chemicals taking part in respiratory electron transport are

A. Flavin nucleotides

B. FeS and CoQ

C. Cytochromes

D. All the above

Answer: A

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76. Noncytochrome members of respiratory electron transport chain are

A. $FAD, NAD^+ \text{ and } CoQ$

B. `FMN, FeS and CoQ

C. FAD, FeS and CoQ

D. $NAD^+, FMN \text{ and } CoQ$

Answer: B

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77. Which one passes protons to outer mitochondrial chamber

A. Fes

B. FMN

C. CoQ

D. Both B and C

Answer: D

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78. Mobile electron carrier in ETS in mitochondrial membrane is

A. Cyt_{a3}

B. FeS

C. CoQ

D. Cyt_{c1}

Answer: C

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79. Electron acceptors in ETS are arranged according to

A. Decreasing positive potential

B. Increasing positive potential

C. Increasing negative potential

D. None of the above

Answer: B

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80. When a pair of electron from $NADH(H^+)$ is transported through respiratory ETS, it results in the formation of

A. 2 mol. Of ATP

B. 4 mol. Of ATP

C. 3 mol. Of ATP

D. 5 mol. Of ATP.

Answer: C

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81. Number of cytochrome molecules required for the transfer of a pair of electrons through ETS is

A. 1

B. 2

C. 3

D. 4

Answer: B

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82. In aerobic respiration which of the following is a reactant

A. CO_2

B. O_2

C. H_2O

D. Sugars

Answer: B

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83. During complet metabolism of glucose, the number of ATP formed is

A. 20

B. 32

C. 36

D. 40

Answer: D

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84. In the electron transport system,a molecule of ATP is formed when an electron passes from :

A. $NADH(H^{+}) \rightarrow FAD$

B. $Cytb \rightarrow Cytc$

C. $Cyta \rightarrow Cyta_3$

D. All the above

Answer: D

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85. Cytochromes take part in

A. Respiration

B. Photosynthesis

C. Electron transport

D. Oxidation

Answer: C

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86. What is true for respiration

A. Oxygen is essential

B. Oxygen combines with carbon form CO_2

C. Oxygen combines with hydrogen to produce water

D. Oxygen is not essential

Answer: C

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87. Major function of respiration is to produce

A. $NADH(H^{+})$

B. ATP

C. Pyruvate

D. C_2H_5OH

Answer: B

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88. In cytochromes, electrons are picked up and released by

A. Fe

B. Mo

C. Cu

D. Zn

Answer: A

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89. Oxygen required for terminal oxidation enters mitochondria as

A. Glucose

B. Activated acetic group

C. Oxygen gas

D. Pyruvic acid

Answer: C

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90. Electrons taking part in electron transport system inside mitochondira come from

A. Pyruvate

B. $NADH(H^{+})$

C. $FADH_2$

D. Both B and C

Answer: D

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91. In electron transport system a carrier holds electron at

A. Higher energy level than the previous carrier

B. Lower energy level than the perivous carrier

C. Same energy level as the adjacent ones

D. Initially holds it at higher level but the electron loses energy during its contact with carrier.

Answer: B

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92. ATP generated by $1NADH_2 \text{ and } 1FADH_2$ are respectively

A. 3 and 2

B. 1 and 1

C. 2 and 3

D. 3 and 3

Answer: A

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93. Members of electron transport chain of respiration are present in

A. Mitochondrial matrix

B. Inter-membrane space

C. Inner mitochondrial membarane

D. Outer mitochondrial membrane.

Answer: B

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94. Within the mitochondrion, the proton gradient develops across the :

A. Inner membrane

B. Inter-membrane space

C. Outer membrane

D. $F_0 - F_1$ particles

Answer: A

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95. The correct equation of aerobic respiration is

A. $C_6H_8O_4 \rightarrow 6CO_2 + 4H_2O$

B. $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$

C. $C_6H_{12}O_6 + 6O_2 + 6H_2O \rightarrow 6CO_2 + 12H_2O + 686$ kcal

D. $C_2H_5OH + 3O_2 \rightarrow 2CO_3 + 3H_2O$

Answer: C

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96. Cytochrome which hands over electrons to oxygen during terminal oxidation is

A. Cyt b

B. Cyt a

C. Cyt c

D. Cyt a3

Answer: D

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97. $2NADH(H^+)$ produced during anaerobic glycolysis yiled

A. 6 ATP molecules

B. 4 ATP molecules

C. 8 ATP molecules

D. None of the above

Answer: D

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98. Oxidative phosphorylation of cytoplasmic $NADH(H^+)$ takes place in

A. Cytosol

B. E.R.

C. Mitochondria

D. Golgi bodies.

Answer: C

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99. Cytoplasmic NADH is oxidatively phosphorylated inside mitochondrion. Mitochondrion is impermeable to NADH. Entry into mitochondrion is effect through

A. Shuttle system

B. Faciliated diffusion

C. Active absorption

D. F_0 tunnel of elementary particles.

Answer: A

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100. In muscles and nerves, cytoplasmic NADH yields

A. 3 ATP

B. 2 ATP

C. 1 ATP

D. No ATP

Answer: B

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101. In heart, liver and kidneys, cytoplasmic NADH employs malate-aspartate shuttle that yields

(a) 3 ATP

(b) 2 ATP

(c) 1 ATP

(d) No ATP

A. 3 ATP

B. 2 ATP

C. 1 ATP

D. No ATP

Answer: A

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102. In pentose phosphate shunt, the number of NADPH formed per glucose molecule is

A. 12

B. 6

C. 2

D. 10

Answer: A

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103. In hexose monophosphate shunt, the net formation of ATP molecules is

A. 36

B. 35

C. 38

D. 34

Answer: B

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104. Hexose monophosphate pathway takes place in

A. Mitochondrial matrix

B. Cristae

C. Cytoplasm

D. E.R.

Answer: C

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105. Which one produces more energy per glucose molecule

A. Alcoholic fermentation

B. Glycolysis

C. Pentose phosphate pathway

D. Lactic acid fermentation

Answer: C

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106. Phosphogluconate shunt occurs in

A. Mitochondria

B. Chloroplasts

C. Cytoplasm

D. Both A and B

Answer: C

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107. Pentose phosphate pathway is a mode of

A. Amphibolic pathway

B. Anabolic pathway

C. Aerobic pathway

D. Anaerobic respiration.

Answer: C

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108. Which one undergoes decarboxylation in hexose monophosphate shunt

A. Glucose 6-phosphate

B. $6 - glucono\gamma - lac \rightarrow \neq$

C. 6-phosphogluconate

D. Fructose 6- phosphate

Answer: C

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109. The first pentose sugar formed in PPP of respiration in

A. Ribulose 5-phosphate

B. Ribose 5-phosphate

C. Xylulose 5-phosphate

D. Deoxyribose 5-phosphate

Answer: A

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110. Reduced coenzyme $NADPH(H^{+})$ is produced in respiration during

A. Glycolysis

B. PPP

C. krebs cycle

D. Terminal oxidation

Answer: B

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111. The term Zymosis was coined by

A. Pasteur

B. Cruickshank

C. Kostytchev

D. Buchner

Answer: A

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112. "Life without air" was first studied by

A. Dubrunfaut

B. Pasteur

C. Berzelius

D. Cruickshank.

Answer: B

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113. The term fermentaiton was coined by

A. Cruickshank

B. Kostytchev

C. Pasteur

D. Buchner

Answer: A

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114. The term anaerobic respiration was coined by

A. Blackman

B. Duclaux

C. Kostytchev

D. Buchner

Answer: C

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115. Anaerobic respiration is

A. Complete oxidation

B. Incomplete oxidation

C. Anabolic reaction

D. Fermentation

Answer: D

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116. Buchner was successful in extracting a respiratory enzyme complex

A. ATP

B. NADH

C. Zymase

D. Mitochondria.

Answer: C

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117. An important requirement of fermentation is

A. Oxygen

B. Zymase

C. Fe

D. CO_2

Answer: B

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118. In muscles, anaerobic conditions change pyruvic acid to

A. C_2H_5OH

B. $C_3H_4O_3$

C. $C_3H_6O_3$

D. C_2H_4O

Answer: C

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119. Which type of fermentation is accompanied by CO_2 evolution

A. Alcoholic fermentation

B. Lactic acid fermentation

C. Both A and B

D. None of the above

Answer: A

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120. Which is not formed during anaerobic respiration

A. Pyruvate

B. Ethyl alcohol

C. CO_2

D. Acetyl CoA.

Answer: D

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121. A gas is not produced during

A. Alcoholic fermentation

B. Aerobic respiration

C. Lactic acid fermentation

D. Both A and B

Answer: C

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122. Anaerobic respiration occurs in human body inside

A. Liver

B. Kidneys

C. Red muscles

D. White muscles.

Answer: D

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123. House sparrow can fly for short distances only because of the absence of

A. White muscles

B. Proper wing span

C. Pneumatic bones

D. Red muscles.

Answer: D

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124. Respiratory intermediate which undergoes fermentation is generally

A. Glyceraldehyde 3-phosphate

B. 2-phosphoglyceric acid

C. PEP

D. Pyruvic acid

Answer: D

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125. In alcoholic fermentation, CO_2 is evolved during

A. Decarboxylation of pyruvic acid

B. Formation of acetaldehyde

C. Oxidation of acetaldehyde

D. Both A and B

Answer: D

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126. Formation of lactic acid from pyruvate requires

A. Decarboxylation

B. Reduction

C. Oxidation

D. Hydration.

Answer: B

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127. A characteristic feature of some fruit ripening is sudden increase in respiration. It is known as

A. Climacteric

B. Anthesis

C. Climatic

D. Photorespiration

Answer: A

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128. Respiration is accompained by

A. Increase in weight

B. Decrease in weight

C. No change in weight

D. Decrease in size

Answer: B

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129. Fruits kept in refrigerator maintain their flavour and taste for longer perioid due to

A. Nonavailability of oxygen

B. Presence of excess CO_2

C. Presence of excess moisture

D. Slowing down of respiration

Answer: D

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130. Rate of respiration shall

A. Increase with rise in temperature

B. Decrease in the presence of light

C. Increase in winter

D. No change with season and environmental conditions

Answer: A

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131. A bottle containing germinating seeds is connected to a tube having lime water. After sometime, the lime water turns

A. Red

B. Brown

C. Green

D. White

Answer: D

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132. Pasteur effect is due to

A. Change from aerobic to anaerobic

B. Providing oxygen to anaerobically respiring structures

C. Rapid utilisation of ATP

D. Nonsynthesis of ATP

Answer: B

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Revision Questions From Competitive Exams

1. Krebs cycle takes place in

A. Vesicles of E.R.

B. Mitochondria

C. Dictyosomes

D. Chloroplasts.

Answer: B

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2. Energy currency (reservior) of the cells is

A. AMP

B. ATP

C. RNA

D. DNA.

Answer: B

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3. The reactions of Krebs/citric acid cycle take place

A. In the cytoplasm

B. In ER

C. In matrix of mitochondira

D. On the surface of mitochondria

Answer: C

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4. The other name of glycolysis is

A. EMP-pathway

B. TCA-pathway

C. HMS-pathway

D. Carbon-pathway

Answer: A

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5. The number of molecules of pyruvic acid formed from one molecule of glucose at the end of glycolysis is

A. 1

B. 2

C. 3

D. 4

Answer: B

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6. The enzyme which converts glucose to glucose 6-phosphate is

A. Phosphorylase

B. Glucose-6 phosphatase

C. Hexokinase

D. Pyruvic acid to lactic acid.

Answer: C

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7. Pyruvate dehydrogenase is used in converting

A. Pyruvic acid to acetyl co-enzyme A

B. Pyruvate to glucose

C. Glucose to pyruvate

D. Pyruvic acid to lactic acid.

Answer: A

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8. The respiratory enzymes are located in

A. Mitochondrial matrix

B. Perimtochondrial space

C. Cristae

D. Outer membrane

Answer: A

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9. Fermentation is

A. Anaerobic respiration

B. Incomplete oxidation

C. Complete oxidation of carbohydrates

D. None of the above

Answer: A

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10. R.Q. for fatty substance/fat is

A. Unity

B. Greater than one

C. Less than one

D. Zero

Answer: B

Watch Video Solution

11. R.Q. for glucose (carbohydrates) is

A. 1

B. 0.5

C. 2

D. 0.05

Answer: A

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12. The amount of energy given by one mole of ATP is

A. 7.3 kcal

B. 721 kcal

C. 7600 kcal

D. 1000 kcal.

Answer: A

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13. Krebs' cycle starts with the formation of a six carbon compound by reaction between

A. Malic acid any acetyl CoA

B. Succinic acid and pyruvic acid

C. Fumaric acid and pyruvic acid

D. Oxalo-acetic acid and acetyl CoA.

Answer: C

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14. Enzymes taking part in glycolysis are present in

A. Cytoplasm

B. Mitochondria

C. Both mitochondria and cytoplasm

D. Vacuole.

Answer: B

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15. Which of the following process is used in the conversion of pyruvate to acetyl CoA ?

A. oxidative decarboxylation

B. Oxidative decarboxylation

C. Oxidative dehydration

D. Oxidative phosphorylation.

Answer: A

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16. Common immediate source of energy in cellular activity is

A. DNA

B. ATP

C. RNA

D. NAD

Answer: B

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17. What is the net gain of ATP in glycolysis ?

A. 6

B. 2

C. 4

D. 8

Answer: D

Watch Video Solution

18. The net gain of energy from two molecule of glucose during aerobic respiration is

A. 2 ATP

B. 4 ATP

C. 38 ATP

D. 40 ATP

Answer: C

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19. Both respiration and photosynthesis require

A. Sunlight

B. Chlorophyll

C. Glucose

D. Cytochromes.

Answer: D

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20. Respiration can occur in the absence of oxygen in

A. Salanum tuberosum

B. Spirogyra

C. Yeast

D. Homo sapiens

Answer: C

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21. During respiration, pyruvic acid is

A. Formed only when oxygen is available

B. One of the products of Krebs cycle

C. Broken down into a two carbon fragment and CO_2

D. A result of protein breakdown

Answer: C

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22. Complete oxidation of one gram mol. Of glucose gives rise to

A. 6860,000 cal

B. 686,000 cal

C. 68,600 cal

D. 6,860 cal

Answer: B

Watch Video Solution

23. Maximum amount of energy/ATP is liberated on oxidation of

A. β-amino acid

B. Malic acid

C. Palmitic acid

D. Glucose

Answer: C

Watch Video Solution

24. At the end of glycolysis, six carbon compound ultimately changes into

A. Protein is converted into glucose

B. Glucose is converted into glycogen

C. Starch is converted into glucose

D. Glucose is converted into pyruvic acid.

Answer: D

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25. Carbon dioxide is liberated during

A. Photosynthesis

B. Respiration

C. Transpiration

D. Ascent of sap.

Answer: B

Watch Video Solution

26. In the TCA cycle, $FADH_2$ is formed during

A. Pyruvic acid is converted into $CO_2 \text{ and } H_2O$

B. ADP is Converted into ATP

C. Glucose is converted into CO_2

D. Pyruvic acid is converted into ATP.

Answer: A

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27. Raw material of respiration is

A. Glucose and fructose

B. Glucose and sucrose

C. $Glu\cos e+O_2$

D. $Glu\cos e + CO_2$

Answer: C

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28. In respiration, 180 g sugar and 192 g oxygen produce

A. 132 g of CO_2, 54, g of water and 343 Col. Energy

B. 264 g of CO_2, 108 g of water and 686 Cal. Of energy

C. 528 g of CO_2, 216 g for water and 1372 Cal. Of energy

D. Large amount of CO_2, no water and no energy.

Answer: B

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29. What is the total gain of energy during anaerobic respiration

A. Two ATP

B. One ATP

C. Four ATP

D. Three ATP

Answer: A

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30. Respiration differs from combustion in which of the following ?

A. Liberating more energy as compared to combustion

B. Liberating of all the energy at once in contrast to combustion

C. Liberation of energy gradually in steps in contrast to combustion

D. Carbohydrates take part as the combustion substance

Answer: C

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31. Synthesis of ATP in mitochondria takes place

A. At the outer membrane

B. At the cristae

C. In the matrix

D. In the intra-cristal space.

Answer: B

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

A. Hydrogen

B. Oxygen

C. Cytochromes

D. Dehydrogenases.

Answer: B

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33. Oxidative phosphorylation is done by

A. Chloroplasts

B. Leucoplasts

C. Peroxisomes

D. Mitochondria

Answer: D

Watch Video Solution

34. In opuntia, in night the R.Q. will be

A. One

B. More than one

C. Zero

D. Mitochondria.

Answer: C

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35. If respiratory quotient is less than 1, what is the respiratory substrate?

A. Sucrose

B. Fat

C. Glucose

D. Less than one

Answer: B

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36. Which intermediate compound acts as connecting link between glycolysis and Krebs' cycle/link between carbohydrate alild fat metabolism

A. Oxaloacetic acid

B. Succinic acid

C. Citric acid,

D. Acetyl CoA.

Answer: D

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37. Citric acid cycle is the alternate name of

A. HMP shunt

B. Glycolysis

C. TCA cycle

D. Calvin cycle

Answer: C

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38. Which of the following is the key intermediate compound linking glycolysis to the Krebs cycle ?

A. Malic acid

B. Acetyl CoA

C. NADH

D. ATP.

Answer: B

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39. Give appropriate biological / technical terms for the following:

A common phase in both aerobic and anaerobic respiration.

A. Krebs cycle

B. EMP/glycolysis

C. Oxidative phosphorylation

D. PPP.

Answer: B

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40. R.Q. of protein rich pulses/Pisum sativum is

A. Unity

B. Infinity

C. More than unity

D. Less than one

Answer: D

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41. Upon complete oxidation of 1 molecule of pyruvic acid in mitochondrial respiration the molecules of ATP generated are

A. 6

B. 2

C. 15

D. 30

Answer: C

Watch Video Solution

42. How many ATPs will be produced during the production of 1 molecule of acetyl CoA from 1 molecule of pyruvic acid?

A. 12 ATP

B. 15 ATP

C. 6 ATP

D. 19 ATP

Answer: A

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43. In germinating castor seeds, the R.Q. is

or

A mixture containing equal quantity of germinating maize and groundnut seeds are taken. The RQ of this mixture would be

A. Less than one

B. More than one

C. One

D. Zero

Answer: A

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44. Maximum energy is obtained by the oxidation of

A. Fats

B. Proteins

C. Starch

D. Vitamins

Answer: A

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45. End product of glycolysis are

A. Acetyl CoA

B. Pyruvic Acid

C. Glucose 1-phosphate

D. Fructose 1-phosphate

Answer: B

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46. In the hexose monophosphate shunt pathway, the number of CO_2 molecules evolved is ________.

A. Less than glycolysis

B. Much less than glycolysis

C. More than glycolysis

D. Same as glycolysis

Answer: C

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47. Both ATP and Mg^2 are involved in the activity of

A. Pyruvic Kinase

B. Glucokinase

C. Phosphogluco isomerase

D. PGA dehydrogenase

Answer: B

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48. R.Q is the ratio of

A. CO_2 produced to sbstrate consumed

B. CO_2 produced to O_2 consumed

C. Oxygen consumed to water produced

D. Oxygen consumed to CO_2 produced.

Answer: B

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49. Which of the following is formed from phosphorylation ?

A. Fructose 1,6-biphosphate

B. Phosphoglyceric acid

C. PEP

D. Pyruvic acid.

Answer: A

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50. The reaction involved in reduction of NAD^{+} is

A. $Glu\cos e \rightarrow Glu\cos e6 - P$

B. Fructose 1,6 diphosphate $- - - PGAL + DiHAP$

C. $Glu\cos e6 - P \to Fruc \to se6 - P$

D. $PGAL \to PGA.$

Answer: D

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51. In succulents, respiratory quotient is less than one due to

A. Incomplete oxidation

B. Incomplete reduction

C. Complete reduction

D. Complete oxidation

Answer: A

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52. End product of fermentation of sugars is

A. Water and carbon dioxide

B. Alcohol and carbon dioxide

C. Carbon dioxide

D. Alcohol.

Answer: B

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53. End products of aerobic respriation are

A. Sugar and oxygen

B. Water and energy

C. Carbon dioxide, water and energy

D. Carbon dioxide and energy.

Answer: C

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54. First reduction in pentose phosphate pathway is

A. Oxidation of 6-phosphogluconate

B. Oxidation of fructose 6-phosphate

C. Oxidation of glucose 6-phosphate

D. Oxidation of fructose 5-phosphate.

Answer: C

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55. Succinate is oxidised to fumarate in Krebs cycle by

A. Removal of hydrogen

B. Loss of electrons

C. Addition of oxygen

D. Removal of oxygen

Answer: A

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56. Sequence of organic acids in Krebs cycle is

A. $\alpha - K \rightarrow glutaricacid Isocitricacid \rightarrow Oxalo \succ \in icacid$

B. $Isocitricacid \rightarrow Oxalo \succ \in icacid \rightarrow \alpha - Ke \rightarrow glutaricacid$

C. $Isocitricacid \rightarrow \alpha - Ke \rightarrow glutaricacid \rightarrow Oxalo \succ \in icacid$

D. $Oxalo \succ \in icacid \rightarrow Isocitricacid \rightarrow \alpha - Ke \rightarrow glutaricacid.$

Answer: B

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57. Connecting link betwee glycolysis and Krebs cycle is/before entering Krebs cycle pyruvate is changed to

A. Oxaloacetate

B. PEP

C. Pyruvate

D. Acetyl CoA.

Answer: D

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58. If the temperature is increased (above $35^\circ C$)

A. Rate of photosynthesis will decline earlier than that of respiration

B. Rate of respiration will decline earlier than that of photosynthesis

C. There is no fixed pattern

D. Both decline simultaneously.

Answer: A

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59. Oxidative phosphorylation is production of

A. ATP in photosynthesis

B. NADH in photosynthesis

C. ATP in respiration

D. NADH in respiration

Answer: C

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60. When one glucose molecules is completely oxidised , it changes

A. 36 ADP molecules into 36 ATP molecules

B. 38 ADP molecules into 38 ATP molecules

C. 30 ADP molecules into 30 ATP molecules

D. 32 ADP molecules into 32 ATP molecules.

Answer: B

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61. Apparatus to measure rate of respiration and RQ is

A. Auxanometer

B. Potemeter

C. Respirometer

D. Manometer

Answer: C

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62. Pyruvic acid is formed at the end of

A. Calvin cycle

B. Glycolysis

C. Krebs cycle

D. Pentose phosphate way.

Answer: B

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63. Out of 36 ATP molecules produces per glucose molecules during respiration

A. 2 are produced outside glycolysis and 34 during respiratory chain

B. 2 are produced outside mitochondira and 34 inside mitochondira

C. 2 during glycolysis and 34 during Krebs cycle

D. All are formed inside mitochondria.

Answer: B

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64. NADH of glycolysis reacts with an inorganic element during libertaion of energy. The respiration is

A. Photorespiration

B. Fermentation

C. Aerobic respiration

D. Anaerobic respiration.

Answer: C

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65. R.Q. of respiratory substrate $C_{39}H_{72}O_6$ would be

A. 0.718

B. 1.34

C. 2.71

D. 3.25

Answer: A

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66. Terminal cytochrome of respiratory chain which donates electrons to oxgyen is

A. Cyt. B

B. Cyt. C

C. $Cyt. A_1$

D. $Cyt. A_3$

Answer: D

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67. R.Q. can vary due to

A. Temperature

B. Respiratory substrate

C. Light and oxygen

D. Respiratory product.

Answer: B

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68. R.Q. is maximum when respiratory substrate is

A. Glucose

B. Fat

C. Protein

D. Malic acid.

Answer: D

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69. Number of carbons in pyruvic acid is

A. 6

B. 3

C. 2

D. 1

Answer: B

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70. Metabolic water is the one

A. Used during transamination

B. Used during photosynthesis

C. Produced during aerobic utilisation of glucose

D. Produced during condensation or polymerisation.

Answer: C

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71. Fumarase changes fumaric acid into

A. Malic acid

B. Maleic acid

C. Citric acid,

D. Succinic acid.

Answer: A

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72. Enzyme helping in oxidative decarboxylation of pyruvic acid is

A. Pyruvic Kinase

B. Pyruvic dehydrogenase

C. Malate dehydrogenase

D. Succinic dehydrogenase.

Answer: B

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73. End product of citric acid/Kreb's cycle is

A. Citric acid

B. Lactic acid

C. Pyruvic acid

D. $CO_2 + H_2O$

Answer: D

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74. Respiration is

A. Anabolic process

B. Physical process

C. Catabolic process

D. Amphibolic process.

Answer: C

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75. Out of 38 ATP molecules per glucose, 30 ATP molecules are formed from $NADH / FADH_2$ in

A. Respiratory chain

B. Krebs cycle

C. Oxidative decarboxylation

D. EMP.

Answer: A

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

A. 8 times

B. 12 times

C. 19 times

D. 36 times

Answer: C

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77. In germinating seed, R.Q. falls when there is shift from

A. Carbohydrate to fat as substrate

B. Fat to carbohydrate

C. Aerobic to anaerobic respiration

D. Protein to carbohydrate.

Answer: A

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78. Life without air would be

A. Reductional

B. Free from oxidative damage

C. Impossible

D. Anaerobic.

Answer: D

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79. Glycolysis is part of

A. Only anaerobic respiration

B. Krebs cycle

C. Only aerobic respiration

D. Both aerobic and anaerobic respiration.

Answer: D

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80. Krebs cycle is

A. Oxidation of glucose to alcohol and water

B. Oxidation of acetyl CoA to carbon dioxide and water involving electron transport

C. Complete oxidation of acetyl CoA without electron transport

D. Complete reduction of acetyl CoA to carbon doxide and water.

Answer: C

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81. Removal of hydrogen and CO_2 from a substrate is called

A. Electrons

B. Protons

C. Photons

D. Both B and C

Answer: A

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82. What are substrates of floating and protoplasmic respiration respectively

A. Carbohydrate

B. Protein

C. Fat

D. Organic acids.

Answer: B

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83. NAD of Krebs cycle functions as

A. Acceptor of hydrogen ion and electrons

B. Oxygen acceptor

C. Oxygen donor

D. Donor of phosphate ions.

Answer: A

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84. Number of NADH produced during breakdown of one molecule of glucose to 1 : 3 diphosphoglycerate stage is

A. 6

B. 4

C. 3

D. 2

Answer: D

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85. ATP is injected in cyanide poisoning because it is

A. Necessary for cellular functions

B. Necessary for $Na^{+} - K^{+}$ pump

C. $Na^{+} - K^{+}$ pump operates at the cell membranes

D. ATP breaks down cyanide.

Answer: A

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86. Fermentation products of Yeast are

A. $H_2O + CO_2$

B. Methyl alcohol $+CO_2$

C. Methyl alcohol + Water

D. Ethyl alcohol $+CO_2$

Answer: D

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87. Glycolysis is

A. $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$

B. $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$

C. $C_6H_{12}O_6 \rightarrow 2C_3H_4O_3 + 4H^+$

D. $C_3H_4O_3 + NADH \rightarrow C_2H_5OH + CO_2 + NAD^+$

Answer: C

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88. Biological oxidation in Kreb's cycle involves

A. N_2

B. O_2

C. SO_2

D. CO_2.

Answer: B

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89. Oxidative phosphorylation occurs during the process of

A. Transpiration

B. Respiration

C. Protein synthesis

D. Nitrogen metabolism.

Answer: B

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90. Mitochondria supply most of the necessary biological energy be

A. Breaking of proteins

B. Reduction of $NADP^+$

C. Breaking of sugars

D. Oxidising TCA substrates.

Answer: D

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91. Cytochromes are component of ETC and act as

A. Electron acceptors

B. Protein acceptors

C. Oxygen acceptors

D. Passage way for carbohydrates.

Answer: A

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92. Respiratory substrate yielding maximum number of ATP molecules is

A. Ketogenic amino acids

B. Glucose

C. Amylose

D. Glycogen

Answer: B

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93. Glycolysis and TCA cycle operate respectively in

A. Cytosol and matrix of mitochondrion

B. Cytosol and stroma of chloroplast

C. Cytosol and oxysomes of mitochondrion

D. Matrix of mitochondrion and inner membrane of mitochondrion.

Answer: A

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94. Which component of ETC is not a protein ?

A. Cytochrome

B. Ubiquinone

C. Cytochrome oxidase

D. All the above

Answer: B

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95. Pyruvic acid is a product of

A. Acetic acid

B. Acetyl CoA

C. Starch

D. Glucose.

Answer: D

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96. End product of glycolysis are

A. FAD

B. NADH

C. NAD

D. NADP.

Answer: B

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97. Conversion of ATP to ADP releases

A. Energy

B. Enzyme

C. Hormone

D. Electricity.

Answer: A

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98. The site Krebs cycle in bacteria is

A. Nucleoid

B. Cytoplasm

C. Plasma membrane

D. Ribosomes

Answer: C

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99. Oxidation of glucose to CO_2 and water occurs during

A. Glycolysis

B. oxidative phosphorylation

C. Krebs cycle

D. All the above

Answer: B

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100. Oxidation of pyruvate to CO_2 and H_2O occurs through

A. Citric acid cycle

B. Tricarboxylic acid

C. Krebs cycle

D. All the above

Answer: D

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101. Step in which glucose is catabolised in animal cell in cytoplasm takes place is called

A. Krebs cycle

B. Glycolysis

C. Oxidative phosphorylation

D. E.T.C.

Answer: B

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102. R.Q. of malic acid is

A. 1.3

B. 4

C. 0.7

D. 1

Answer: A

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103. Enzymes of oxidative phosphorylation occur in

A. Endoplasmic reticulum

B. Chloroplasts

C. Mitochondria

D. Golgi apparatus.

Answer: C

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104. End products of aerobic respriation are

A. Malic acid

B. Ethyl alcohol

C. Lactic acid

D. Pyruvic acid.

Answer: A

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105. For two molecules of glucose, glycolysis uses and produces ATP molecules

A. 4 and 8

B. 2 and 4

C. 2 and 8

D. 2 and 2

Answer: A

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106. Krebs cycle is component of

A. Photosynthesis

B. Aerobic respiration

C. Anaerobic respiration

D. Photorespiration

Answer: B

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107. Fructose 1 : 6 biphosphate splits into two triose phosphates by enzyme

A. Aldolase

B. Amylase

C. Zymase

D. Lipase.

Answer: A

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108. Mitochondria are called power houses because they store

A. Glycogen

B. Glucose

C. ATP

D. Fats.

Answer: C

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109. Respiration is

A. Catabolic process that uses carbon dioxide, produces oxygen and converts released energy to ATP

B. Anabolic process that uses oxygen and carbon dioxide to form ATP

C. Anabolic process that uses oxygen, produces carbon dioxide and converts released energy into ATP

D. Catabolic process that uses oxygen, produces carbon dioxide and converts released energy into ATP.

Answer: D

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110. In Krebs' cycle, the H^+ removed at succinate level is accepted by

A. NAD

B. FAD

C. NADP

D. ADP

Answer: B

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111. Amount of usable energy available for work at uniform temperature and pressure is

A. 686000 cal

B. 304000 cal

C. 277400 cal

D. 686 cal.

Answer: C

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112. Which one yields the maximum energy ?

A. Krebs cycle

B. Anaerobic respiration

C. Glycolysis

D. Aerobic respiration

Answer: D

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113. Which one can respire in the absence of oxygen ?

A. Seeds

B. Leaves

C. Stem

D. Root.

Answer: A

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114. In glycolysis, glucose splits into compounds which are

A. 5-C

B. 4-C

C. 5-C

D. 3-C

Answer: D

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115. Krebs cycle is

A. Aerobic

B. Anaerobic

C. Anabolic

D. None of the above

Answer: A

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116. End product of oxidative phosphorylation is

A. ATP

B. $ATP + H_2O$

C. NADH

D. Oxygen

Answer: B

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117. R.Q. of 4 is obtained when respiratory substrate is

A. Oxalic acid

B. Malic acid

C. Tartaric acid

D. Glucose.

Answer: A

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118. Mitochondrial matrix has enzymes for

A. Krebs cycle

B. TCA cycle and electron transport

C. Glycolysis and TCA cycle

D. Both B and C

Answer: A

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119. ETC and TCA enzymes occur in

A. Ribosomes

B. Endoplasmic reticulum

C. Mitochondria

D. Cytoplasm and nucleus.

Answer: C

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120. In case NADH is oxidised in a single step to from water

A. Cell will burn

B. Most of energy is liberated as heat

C. 3 ATP are formed

D. 5 ATP are formed.

Answer: B

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121. When succinyl-CoA is converted into succinic acid, the energy-storing compound formed is

A. ATP

B. GTP

C. CTP

D. ATP in plants and GTP in animals.

Answer: D

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122. Krebs cycle forms an important product

A. Acetyl CoA

B. ADP

C. ATP

D. Water.

Answer: C

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123. Fermentation produces

A. Protein and acetic acid

B. alcohol and lipoprotein

C. alcohol, lactic acid, etc.

D. Ethers and acetones.

Answer: C

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124. Lactic acid fermentation does not produce

A. ATP

B. CO_2 and $NADH$

C. CO_2

D. NADH

Answer: B

Watch Video Solution

125. Iron-prophyrin protein complex occurs in

A. Cytochrome

B. Chlorophyll

C. Phytochrome

D. Both A and B

Answer: A

Watch Video Solution

126. Number of ATP produced from one pyruvic acid during conversion to acetyl CoA is

A. 3

B. 5

C. 8

D. 15

Answer: A

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127. NADH is produced in

A. Photosystem II

B. Photosystem I

C. Glycolysis

D. Both A and B

Answer: C

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128. The correct sequences of electron acceptor 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

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129. Anaerobic process after glycolysis is known as

A. TCA cycle

B. Krebs cycle

C. Calvin cycle

D. None of the above

Answer: D

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130. Electron transport sytem in mitochondria is located in

A. Outer membrane

B. Inner membrane

C. Inter-cristal space

D. Outer chamber.

Answer: B

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131. Protein is respiratory substrate in

A. Seeding state

B. Anaerobic respiration

C. Protoplasmic respiration

D. Floating respiration.

Answer: C

Watch Video Solution

132. Number of oxygen atoms required for complete oxidation of one molecule of pyruvic acid

A. 6

B. 12

C. 3

D. 8

Answer: A

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133. FAD participates in Krebs' cycle as electron acceptor during conversion of

A. $\alpha - \text{Ketoglutarate} \rightarrow \text{Succinyl } CoA$

B. $\text{Succinic acid} \rightarrow \text{Furmaric acid}$

C. $\text{Succinyl CoA} \rightarrow \text{Succinic acid}$

D. $\text{Fumaric acid} \rightarrow \text{Malic acid.}$

Answer: B

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134. $ADP \rightarrow ATP$ system was found by Lipmann in

A. 1940

B. 1950

C. 1960

D. 1970

Answer: A

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135. α-Ketoglutarate dehydrogenase brings about

A. Oxidation and decarboxylation

B. Oxidation

C. Decarboxylation

D. Reduction.

Answer: A

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136. Fructose-6-phosphate is changed to Fructose 1-6 biphosphate with the help of enzyme

A. Phosphoglycerate

B. Phosphatase

C. Phosphofructo-kinase

D. Enolase.

Answer: C

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137. Which theory explains ATP synthesis in chloroplasts and mitochondira ?

A. Lipman and Lohmann theory

B. Lock and key theory of Fischer

C. Induced fit theory of Fischer

D. Chemi-osmotic theory of Mitchell.

Answer: D

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138. In bacteria the respiratory enzymes are located on

A. Cytoplasm

B. Mesosome

C. Episome

D. Plasmid.

Answer: B

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139. Krebs' cycle starts with the formation of a six carbon compound by reaction between

A. OAA+Acetyl CoA

B. Citric acid + Acetyl CoA

C. OAA + Pyruvic acid

D. OAA + Citric acid.

Answer: A

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140. Oxidative phosphorylation occurs during

A. Fumaric acid$\rightarrow$Malic acid

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

C. Succinic acid$\rightarrow$Fumaric acid

D. $\alpha -$ Ketoglutaric acid $\rightarrow$ Succinic acid.

Answer: D

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141. Which one is absent in erythrocytes ?

A. Krebs cycle

B. Enzymes

C. Biomembrane

D. Hyaloplasm.

Answer: A

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142. Production of alcohol by Yeast fermentation is .... Process

A. Anaerobic

B. Aerobic

C. Light dependent

D. Both A and C.

Answer: A

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143. Differences between photophosphorylation (PP) and oxidative phosphorylation (OP) is

A. In PP, synthesis is of ATP while in OP it is of ADP

B. In PP, oxygen is evolved while in OP oxygen is taken up

C. Both cannot take place in light

D. PP can take place in green leaves while OP cannot occur in green leaves.

Answer: B

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144. Conversion of sugar into alcohol during fermentation is due

A. Temperature

B. Concentration of sugar

C. Zymase

D. Microorganisms.

Answer: C

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145. Cofactor required for formation of acetyl CoA is

A. TPP

B. Lipoic acid

C. Mg^{2+}, CoA

D. All the above

Answer: D

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146. R.Q. for organic acid is

A. 1

B. > 1

C. < 1

D. 0.

Answer: B

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147. Before entering respiratory pathway. Amino acid are

A. Decarboxylated

B. Hydrolysed

C. Deaminated

D. Phosphorylated.

Answer: C

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148. Energy formed during conversion of glucose to pyruvate is equvalent to

A. 32 ATP

B. 16 ATP

C. 8 ATP

D. 4 ATP.

Answer: C

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149. General equation for aerobic respiration is

A. $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

B. $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + 686kcal$

C. $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2 + 2ATP$

D. $C_6H_2O_6 \rightarrow 2C_3H_6O_3 + 2ATP.$

Answer: B

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150. Which of the following enzymes is absent in mitochondria

A. Aconitase

B. Malic dehydrogenase

C. Fumarase

D. Hexokinase.

Answer: D

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151. Excess of ATP inhibits which enzyme

A. Phosphofructokinase

B. Hexokinase

C. Pyruvic decarboxylase

D. Aldolase.

Answer: A

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152. Anaerobic respiration in animals produces

A. $Glu\cos e \quad \text{and} \quad O_2$

B. $C_2H_5OH \quad \text{and} \quad CO_2$

C. $\text{Lactic acid and water}$

D. $CO_2 \quad \text{and} \quad H_2O$

Answer: C

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153. Number of carbon atoms available in Acetyl CoAis

A. 6

B. 4

C. 3

D. 2

Answer: D

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154. Match the contents of column I with that of column II and choose the correct option.

a	H^+, OH^-	p	Glycolysis
b	Pyruvic acid	q	Alcoholic fermentation
c	C_2H_5OH, CO_2	r	Chemosynthesis
		s	Photolysis of water

A. a-s, b-q, c-p

B. a-s, b-r, c-p

C. a-s, b-p,c-q

D. a-s,b-r,c-q

Answer: C

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155. In glycolysis, enzyme enolase produces

A. Phosphoglyceric acid

B. Phosphoenol pyruvate

C. Phosphoglyceraldehyde

D. Pyruvate.

Answer: B

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156. Which product of glycolysis is consumed in alcoholic fermentaion ?

A. $NADH_2$

B. ATP

C. $ATP \quad \text{and} \quad NADH_2$

D. CO_2.

Answer: A

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157. The number of ATP molecules produced by electron transport system from Krebs cycle intermediates in a single trun is

A. 11

B. 12

C. 14

D. 16

Answer: A

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158. Electron transport requires

A. Cytochromes

B. Phytochrome

C. Enzymes

D. Hormones.

Answer: A

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159. What is the site of glycolysis ?

A. Chloroplasts

B. Chromosome

C. Cytoplasm

D. Nucleus.

Answer: C

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160. The maximum usable energy per molecule of glucose metabolised will be generated during

A. Glycolysis in skeletal muscle of a sprinter

B. Fermentation into ethanol by yeast

C. Fermentation into methanol by eneteric bacteria

D. Aerobic respiration

Answer: D

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161. Enzyme pair common to both EMP and C_3 cycle is

A. Aldolase and enolase

B. Aldolase and triose phosphate isomerase

C. Phosphoglyceromutase and triose phosphate isomerase

D. Cytochrome oxidase and enolase.

Answer: B

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162. Total number of ATP molecules produced per glucose molecule in eucaryotic cell is

A. 38

B. 36

C. 24

D. 12

Answer: B

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163. Energy required to synthesise ATP from ADP and inorganic phosphate is

A. 2500 cal

B. 7600 cal

C. 12000 cal

D. 20000 cal.

Answer: B

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164. Anaerobic respiration of yeast produces

A. N_2

B. O_2

C. CO_2

D. H_2O.

Answer: C

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165. Which can readily respire without oxygen ?

A. Anabaena

B. Saccharomyces

C. Mushroom

D. Fish.

Answer: B

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166. Green plants kept in light produce ATP from glucose. The process is

A. Photophosphorylation

B. Glycolysis

C. TCA cycle

D. Oxidative phosphorylation.

Answer: D

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167. R.Q is more than one in case of

A. Fat

B. Glucose

C. Organic acid

D. Protein.

Answer: C

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168. Alcoholic fermentation is performed by

A. Saccharomyces

B. Lactobacillus

C. Clostridrium

D. Aspergillus.

Answer: A

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169. In an electron transport chain one molecule of $NADH_2$ yields

A. 2 ATP

B. 3 ATP

C. 12 ATP

D. 6 ATP

Answer: B

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170. Which one froms ATP ?

A. Fe and P

B. N and P

C. Fe and Mo

D. Mg and Mn

Answer: B

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171. Metabolism of one palmitic acid yields ATP

A. 36 ATP

B. 56 ATP

C. 129 ATP

D. 48 ATP

Answer: C

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172. Energy for ATP synthesis is obtained from

A. Oxygen ion gradient

B. Hydrogen ion gradient

C. Nitrogen ion gradient

D. All the above

Answer: B

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173. Energy released in aerobic respiration is higher than the one available from anaerobic respiration by

A. 8 times

B. 18 times

C. 28 times

D. 36 times.

Answer: B

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174. Enzymes located in mitochondrial membrane are

A. Enolase and catalase

B. Flavoproteins and cytochromes

C. Hexokinase and zymase

D. Citrate synthetase and glutamate dehydrogenase.

Answer: B

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175. Mitochondiral marker enzyme is

A. Pyruvate dehydrogenase

B. Aldolase

C. Amylase

D. Succinic dehydrogenase.

Answer: D

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176. Oxygen is reduced to water in

A. Fermentation

B. Calvin cycle

C. Electron transport

D. Krebs cycle

Answer: C

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177. Electron transport chain is associated with

A. Photosynthesis

B. Protein synthesis

C. Respiration

D. both a and c

Answer: C

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178. Products of anaerobic respiration are

A. Ethyl alcohol and carbon monoxide

B. Ethyl alcohol and lactic acid

C. Lactic acid and glycogen

D. Acetic acid and carbon dioxide.

Answer: B

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179. Pyruvic acid, the last product of glycolysis, is degraded to CO_2 and H_2o

A. Cytoplasm

B. Inner membrane of mitochondira

C. Matrix of mitochondria

D. Matrix of chloroplasts.

Answer: C

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180. Cyanide resistant respiration is found in

A. Plants

B. Bacteria

C. Viruses

D. Animals.

Answer: A

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181. Component of ETC of mitochondira is

A. Carotenoids

B. Plastocyanin

C. Phytochrome

D. Cytochrome oxidase.

Answer: B

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182. Iron porphyrin occurs in

A. Anthocyanin

B. Phytochrome

C. Cytoplasm

D. FAD.

Answer: C

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183. A sudden change from anaerobic to aerobic process produces

A. Pasteur effect

B. Emerson effect

C. Blackman's law

D. Charagaffs rule.

Answer: A

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184. Bond between first phosphate and adenosine in ATP is

A. Phosphoester bond

B. Nitrophosphate bond

C. Phosphoanhydride bond

D. Adenophosphate bond.

Answer: A

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185. During glycolysis, glucose is first changed to

A. Glucose 6-phosphate

B. Fructose 6-phosphate

C. Glucose 1,6-phosphate

D. Adenophosphate bond.

Answer: A

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186. For their functioning, cytochromes possess

A. Mg

B. Fe

C. Mn

D. Na.

Answer: B

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187. Alcoholic fermentation uses

A. Ribosomes

B. Golgi bodies

C. Mitochondrial enzymes

D. Cytoplasmic enzymes.

Answer: D

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188. Sequence of organic acids in Krebs cycle is

A. $\text{Citric acid} \rightarrow \text{oxalosuccinic acid} \rightarrow \text{isocitric acid}$

B. $\text{Citric acid} \rightarrow \text{isocitric acid} \rightarrow \text{oxalosuccinic acid}$

C. $\text{Isocitric acid} \rightarrow \text{oxalosuccinic acid} \rightarrow \text{citric acid}$

D. $\text{Oxalosuccinic acd} \rightarrow \text{isocitric acId} \rightarrow \text{citric acid.}$

Answer: B

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189. Coenzyme NAD^{+} and FAD are connected with respiratory reactions as they

A. Are involved in each step of ATP synthesis

B. Function in Krebs cycle and terminal oxidative phosphorylation

C. Act as hydrogen carrier

D. Are reducing agents.

Answer: C

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190. The net gain of ATP molecules in glycolysis is

A. 2

B. 4

C. 36

D. 38

Answer: A

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191. Isocitric acid is changed to 2-oxoglutaric acid by

A. Oxidative carboxylation

B. Oxidative decarboxylation

C. Dehydrogentaion

D. Hydrogentaion and decarboxylation.

Answer: B

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192. Glyceraldehyde 3-phosphate is oxidised to 1-3 biphosphoglyceric acid alongwith

A. Release of elecrons for reducing NAD^+

B. ATP synthesis

C. Release of phosphate group

D. Release of H^+ and e^- for forming NADH.

Answer: D

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193. Anaerobic respiration following glycolysis is

A. Oxidative phosphorylation

B. Krebs cycle

C. Fermentation

D. Both A and B.

Answer: C

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194. Select the correct match for the following (a) Net ATP produced in glycolysis (b) Positive Bendedict's test (c) Genes unable to express in presence of their allelas (d) A character controlled by many genes.

A. 36, glucose, recessive, polygenic

B. 8, glucose, recessive, polygenic

C. 32, sucrose, recessive, polygenic

D. 8, fructose, dominant, polygenic.

Answer: A

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195. A molecule of $FADH_2$

A. Consumes one O_2

B. Consumes one H_2O molecule

C. Forms 2ATP

D. All the above

Answer: C

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196. 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. Citrate sysnthetase

B. α-keto glutarate dehydrogenase

C. Succinate dehydrogenase

D. Malate dehydrogenase.

Answer: C

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197. RQ is less than one for

A. Carbohydrate

B. Organic acid

C. Starch

D. Protein.

Answer: D

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198. Fermentation is

A. Incomplete oxidation

B. Anaerobic respiration

C. Excretory process

D. None of the above

Answer: B

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199. Glycolysis is

A. Glucose to glycogen

B. Glycogen to glucose

C. Glucose to glucose

D. Glucose to citric acid.

Answer: C

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200. Anaerobic respiration takes place in

A. Ribosomes

B. Nucleus

C. Vacuole

D. Cytoplasm.

Answer: D

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201. When malic acid is respiratory substrate, the amount of CO_2 released is

A. More than O_2 consumed

B. Less than O_2 released

C. Equal to O_2 consumed

D. CO_2 is not released.

Answer: A

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202. R.Q. is more than one when the substrate is

A. Aerobic respiraton

B. Anaerobic respiration

C. Both A and B

D. None of the above

Answer: C

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203. At the end of TCA cycle, most of the energy removed from the glucose molecule has been transferred to ....

A. $NADH$ and $FADH_2$

B. Oxaloacetic acid

C. Citric acid

D. ATP.

Answer: A

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204. In aerobic respiration one glucose produces

A. $8NADH + 2FADH_2 + 2ATP$

B. $12NADH + 2FADH_2 + 38ATP$

C. $12NADH + 30ATP + H_2o$

D. $10NADH + 2FADH_2 + 2ATP + 2GTP.$

Answer: D

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205. What occurs in glycolysis

A. Fixation

B. Reduction

C. Dehydrogentaion

D. Oxidation.

Answer: D

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206. Match the items of column I and II and choose the correct option.

	Column I		Column II
a	Krebs cycle	p	Stroma
b	Glycolysis	q	Grana
c	Calvin cycle	r	Mitochondrial matrix
		s	Cytoplasm

A. a-s, b-r, c-q

B. a-r, b-s, c-p

C. a-s, b-r, c-p

D. a-r, b-s, c-q.

Answer: B

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207. R.Q. of sprouting photo tubers will be

A. 1

B. >1

C. <1

D. Zero

Answer: A

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208. What is true of Krebs cycle

A. ATP/GTP is formed

B. Two decarboxylations

C. Acetyl CoA mombines with OAA

D. All the above

Answer: D

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209. In respiration

A. 2 PGAL are formed in glycolysis and none in Krebs cycle

B. 6 PGAL in glycolysis, 3 PGAL in Krebs cycle

C. 8 PGAL in glycolysis, 3 PGAL in Krebs cycle

D. PGAL formation does not occur in respiration.

Answer: A

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210. Which one is the last electron acceptor over ETC in oxidative phosphorylation

A. H_2

B. Cyta_3

C. Cyt b

D. CO_2.

Answer: B

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211. Before combining with OAA, pyruvic acid is changed into

A. Succinic acid

B. Malic acid

C. Acetyl CoA

D. Citric acid.

Answer: C

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212. Glycolysis takes place in :

A. All cells

B. Only eukaryotic cells

C. Muscle cells

D. Nerve cells.

Answer: A

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213. 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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214. In alcoholic fermentation

A. Triose phosphate is electron donor while acetaldehyde is electron acceptor

B. Triose phosphate is electron donor while pyruvic acid is electron acceptor

C. There is no electron donor

D. Oxygen is electron acceptor.

Answer: A

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215. The reaction forming 3-phosphoglyceric acid in glycolysis is

A. Cleavage

B. Oxidative phosphorylation

C. Dephosphorylation

D. Oxidative decarboxylation.

Answer: C

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216. Tick the correct statements

A. Anaerobes grow in absence of oxygen

B. Aerophiles can grow in complete absence of oxygen

C. Aerobes can grow in absence of oxygen

D. Obligate anaerobes can live in the presence of abundant oxygen.

Answer: A

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217. An enzyme absent in mitochondrial ETS is

A. FeS protease

B. Glucose 6-phosphate dehydrogenase

C. NADH dehydrogenase

D. Cytochrome c-oxidase.

Answer: B

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218. Which is rich in energy

A. NAD^+

B. Mitochondria

C. FAD

D. ATP.

Answer: D

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219. Mitochondrial electron transport chain is

A. Cyclic phosphorylation

B. Oxidative phosphorylation

C. Noncyclic phosphorylation

D. Photooxidation.

Answer: B

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220. Where are the enzymes of the electron transport system found?

A. Outer membrane of mitochondria

B. Cristae of mitochondira

C. Matrix of mitochondira

D. Oxysomes.

Answer: B

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221. Which one requires oxygen

A. Fermentation

B. EMP pathway

C. Pentose phosphate pathway

D. None of the above

Answer: D

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222. Match and find the correct combination

(a) Respiration in bacteria

(b) Respiration in cyanobacteria

(c) Respiration in eukaryotic cells

(d) Mitochondria

(e) Cytoplasmic membrane

(f) Mesosomes.

A. a-e, b-f, c-d

B. a-f, b-e, c-d

C. a-d, b-f, c-e

D. a-e, b-d, c-f

Answer: B

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223. Number of oxygen molecules required for glycolytic breakdown of one glucose molecule is

A. 38

B. 36

C. 2

D. Zero

Answer: D

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224. Ethanol is formed from acetaldehyde by an enzyme called

A. Lactate dehyderogenase

B. Pyruvate kinase

C. Alcohol dehydrogenase

D. Pyruvate decarboxylase.

Answer: C

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225. Cell respiration is carried out by

A. Mitochondria

B. Golgi bodies

C. Ribosomes

D. Chloroplasts.

Answer: A

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

A. ATP

B. NAD

C. Glyceraldehyde 3-phosphate

D. Molecular oxygen.

Answer: B

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227. Mechansim of aerboic respiraton//tricarboxylic acid pathway was disocovered by

A. Calvin

B. Krebs

C. Pasteur

D. Hatch and Slack.

Answer: B

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228. The number of glucose molecules required to produce 38 ATP molecules under anaerobic conditions by a yeast cells is

A. 2

B. 4

C. 19

D. 38

Answer: C

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229. Pasteur effect is due to

A. Nostoc

B. Penicillium

C. Pinnularia

D. sacharomyces

Answer: D

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230. Ganong's respirometer (respiroscope) is used to demonstrate rate of respiration and

A. Heat during respiration

B. CO_2 during aerobic respiration

C. CO_2 during fermentation

D. `Evolution of oxygen during photosynthesis

Answer: B

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231. Dough kept overnight in warm weather becomes soft and spongy due to

A. Osmosis

B. Absorption of CO_2 from atomosphere

C. Cohesion

D. Fermentation

Answer: D

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232. Which one of the following is the first step of glycolysis?

A. Conversion of glucose into fructose

B. Dehydrogenation of glucose

C. Breakdown of glucose

D. Phosphorylation of glucose.

Answer: D

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233. How many ATP molecules are released when one molecules of glucose is oxidised in our liver cells ?

A. 36

B. 38

C. 2

D. 8

Answer: B

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234. Pasteur effect is

A. Stoppage of fermentation in presence of oxygen

B. Increase of fermentation in presence of oxygen

C. Decrease in fermentation in presence of oxygen

D. No effect on fermentation.

Answer: A

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235. RQ in anaerobic respiration is

A. Zero

B. ∞

C. 1

D. $> 1.$

Answer: B

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236. Which of the following is an important intermediate formed in all types of respiration ?

A. Acetyl CoA

B. Oxaloacetate

C. Pyruvic acid

D. Tricarboxylic acid.

Answer: C

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237. Refer the given equation.

$2(C_{51}H_{98}O_6) + 145O_2 \rightarrow 102CO_2 + 98H_2O +$ Energy The RQ in this case is

A. 0.7

B. 1

C. 1.45

D. 1.62.

Answer: A

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238. Which one of the following is wrong about glycolysis

A. It produces ATP

B. It uses ATP

C. End products are CO_2 and H_2O

D. None of the above

Answer: C

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239. During glycolysis the number of ATP molecules utilised to change glucose into fructose 1, 6 diphosphate are

A. 4

B. 3

C. 2

D. 1

Answer: C

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240. Aerobic respiration occurs within the

A. Thylakoid

B. Golgi body

C. Grana

D. Mitochondria.

Answer: D

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241. A single turn of the citric acid cycle yields

A. $2FADH_2, 2NADH_2, 2GTP$

B. $1FADH_2, 2NADH_2, 1GTP$

C. $1FADH_2, 3NADH_2, 1GTP$

D. $1FADH_2, 4NADH_2, 1GTP$

Answer: C

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242. In electron. transport system , the cytochrome which donates electron to free oxygen Is

A. Cyt a_3

B. Cyt b

C. Cyt b_3

D. Cyt b_6

Answer: A

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243. RQ is less than one for

A. Organic acids

B. Fats and proteins

C. Sucrose

D. Glucose.

Answer: B

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244. Conversion of glucose to glucose-6-phosphate, the first irreversible reaction of glycolysis, is catalyzed by

A. Hexokinase

B. Isomerase

C. Phosphokinase

D. Phosphohexokinase

Answer: A

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245. Chemiosmotic theory of ATP synthesis in the chloroplasts and mitochondria is based on

(a) Proton gradient

(b) Accumulation of K^+ ions

(c) Accumulation of Na^{2+} ions

(d) Membrane potential

A. Membrane potential

B. Accumulation of Na^+ ions

C. Accumulation of K^+ ions

D. Proton gradient.

Answer: D

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

A. Glycolysis

B. Krebs cycle

C. Conversion of pyruvic acid to acetyl CoA

D. Electron transport chain.

Answer: D

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247. Ferrodoxin contains

A. Mg

B. Co

C. Iron

D. Nitrite.

Answer: C

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248. During night, a person should not sleep under a tree because the tree

A. Releases O_2 during night

B. Does not release CO_2 during night

C. Releases CO_2 during night

D. Releases water during guttation.

Answer: C

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249. 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. 1

B. 2

C. 30

D. 57

Answer: D

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250. How many ATPs are formed per glucose molecule in Krebs cycle ?

A. 2

B. 24

C. 6

D. 28

Answer: B

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251. How many molecules of NADH are produced when four molecules of phosphoglyceraldehyde are converted into four molecules of pyruvate?

A. 2

B. 6

C. 8

D. 4

Answer: D

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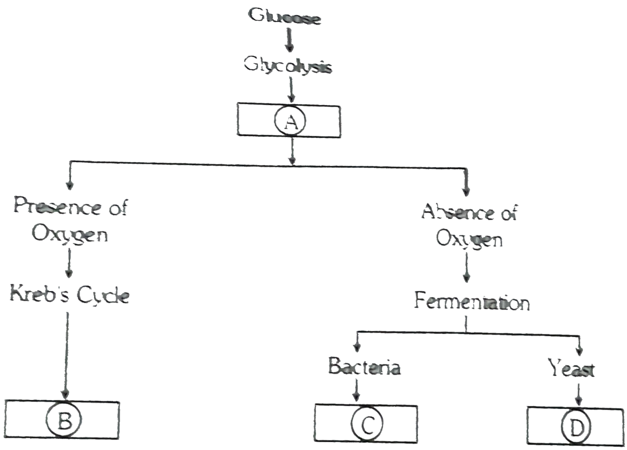
252. The following is a simplified scheme showing the fate of glucose during aerobic and annaerobic respiration. Identify the end products that are formed at stages indicated as A,B, C and D. Identify the correct option from those given below.



A.

a-pyruvic acid, $b - CO_2 + H_2O$, C-ethyl alcohol + CO_2, d-lactic acid

B.

a-pyruvic acid, b-ethyl alcohol + CO_2c-lactic acid, $d - CO_2 + H_2O$

C.

$a - CO_2 + H_2O$, b-pyruvic acid, c-ethyl alcohol + CO_2, d-lactic acid

D.

a-pyruvic acid, $b - CO_2 + H_2O$, c-lactic acid, d-ethyl alcohol + CO_2

Answer: D

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253. Which of the following processes make direct use of oxygen ?

A. Glycolysis

B. Fermentation

C. Electron transport

D. Krebs citric acid cycle

Answer: C

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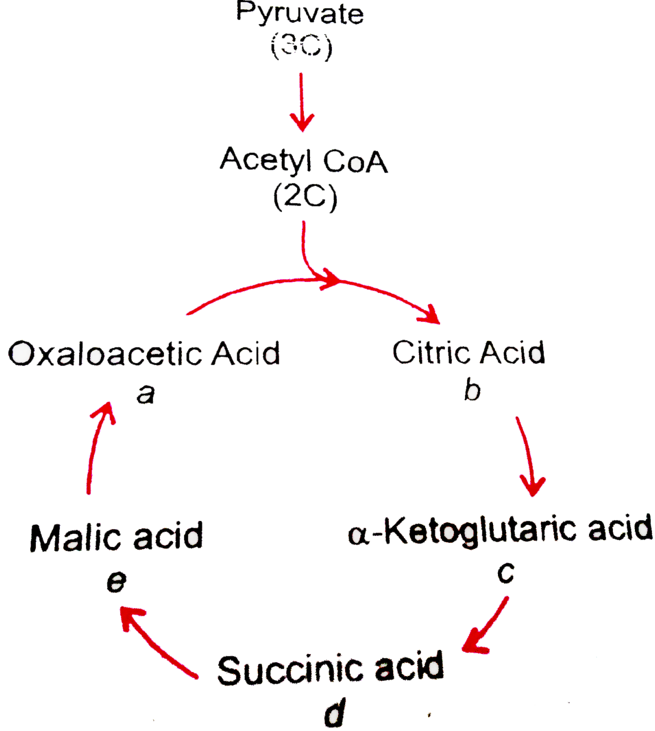
254. Choose the correct combination of labelling the number of carbon compounds in the substrate molecules involved in citric acid cycle.



A. a-4C, b-6C, c-5C, d-4C, e-4C

B. a-6C, b-5C, c-4C, d-5C, e-6C

C. a-4C, b-5C, c-6C, d-4C, e-4C

D. a-4C, b-6C, c-4C, d-5C, e-4C

Answer: A

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255. Which of the following statements is/are not true

A) One ATP molecule yields 32 kJ of energy

B. Pentose Phosphate pathway was discovered by Dickens

C. When tripalmitin is used as a substrate, the R.Q. is 0.7

D. energy released by one molecule of glucose on complete oxidation corresponds to 1292 kJA

A. a and d

B. a and b

C. c and d

D. a, c and d

Answer: B

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256. Respiratory quotient (R.Q.) is

A. Volume of O_2 evolved//Volume of CO_2 consumed

B. Volume of CO_2 evolved//Volume of O_2

C. Volume of O_2 consumed//Volume of CO_2 evolved

D. Volume of CO_2 consumed//Volume of O_2 evolved

Answer: B

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257. Alcoholic fermentation occurs in the presence of

A. Zymase

B. Amylase

C. Invertase

D. Maltase.

Answer: A

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258. RQ of 4, 1 and 0.7 occur in case of

A. Malic acid, palmitic acid and tipalmitin

B. Oxalic acid, carbohydrate and tripalmitin

C. Tripalmitin, malic acid and carbohydrate

D. Palmitic acid, carbohydrate and oxalic acid

Answer: B

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

A. Pyruvic acid

B. Acetyl CoA

C. $NADH_2$

D. NAD (P) H

Answer: D

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260. Match the columns

	I		II
a	4 C Compound	1.	Acetyl CoA
b	2 C Compound	2.	Pyruvate
c	5 C Compound	3.	Citric acid
d	3 Compound	4.	α-ketoglutaric acid
		5.	Malic acid

A. a-2, b-5, c-3, d-1

B. a-3, b-1, c-4, d-2

C. a-5, b-1, c-4, d-2

D. a-5, b-3, c-1, d-2

Answer: C

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261. There is no transfer of electrons from cyt b to cyt c as

A. Energy is not available

B. The two are not nearby

C. Electron are transported in pairs

D. Electrons have no affinity for cyto-chromes.

Answer: B

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262. Which is wrong about Krebs cycle

A. It occurs in mitochondira

B. It starts with 6 carbon compound

C. It is also called citric acid cycle

D. Glycolysis is linked to it through malic acid.

Answer: D

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263. ATP synthesis proposed by Peter Mithchell is

A. Phosphorylation

B. Photophosphorylation

C. Oxidative phosphorylation

D. Chemiosmotic synthesis.

Answer: D

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264. Succinate + FAD forms

A. Fumarate + $FADH_2$

B. Malate + $NADH_2$

C. $Isocitrate +$ NADH_(2)`

D. Citrate + Water.

Answer: A

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265. The enzyme/s that convert pyruvic acid into ethanol is/are

A. Pyruvate dehydrogenase

B. Pyruvate decarboxylase

C. Alcohol oxidase

D. Alcohol dehydrogenase.

Answer: B

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266. In glycolysis, 6-C compounds are split into 3-C compounds by enzyme

A. Isomerase

B. Aldolase

C. Hexokinase

D. Dehydrogenase.

Answer: B

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267. Lactic acid is produced in the process of

A. Fermentation

B. HMP

C. Krebs cycle

D. Glycolysis.

Answer: A

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268. 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. Lactate dehyderogenase

B. Malate dehydrogenase

C. Isocitrate dehydrogenase

D. Succinate dehydrogenase.

Answer: D

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

A. ATP in small stepwise units

B. ATP in one large oxidation reaction

C. Sugars

D. Nucleic acid.

Answer: A

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270. Acetyl CoA forms a 6-C compound after combining with

A. Malic acid

B. Citric acid

C. Succinic acid

D. Oxaloacetic acid.

Answer: D

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271. Which is correct for ADP

A. Two high energy bonds

B. One high energy bond

C. Three high energy bonds

D. None of the above

Answer: B

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272. In the electron transport system,a molecule of ATP is formed when an electron passes from :

A. Cyt c to Cyt a

B. Cyt b to Cyt c

C. Cyt a to Cyt c

D. Cyt c to Cyt b.

Answer: B

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273. In which step of Krebs cycle, CO_2 is evolved

A. Isocitric acid $\rightarrow$ Oxalosuccinic acid

B. Succinic acid $\rightarrow$ Fumaric acid

C. Oxalosuccinic acid $\rightarrow$ α-ketoglutaric acid

D. Maleic acid $\rightarrow$ Oxaloacetic acid.

Answer: C

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274. An enzyme not used in Krebs cycle is

A. Aconitase

B. Decarboxylase

C. Fumarase

D. Aldolase.

Answer: D

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275. In Krebs cycle the conversion of succinyl CoA to succinic acid requires

A. GDP+iP

B. CoA+GTP+ip

C. Acetyl CoA+GDP+iP

D. Acetyl CoA+GTP+iP

Answer: A

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276. Calorific value of carbohydrates, proteins & fats are

A. 4.1 kcal/g, 5.65 kcal/g, 9.45 kal/g

B. 5.65 kcal/g, 10 kcal/g, 2.3 kcal/g

C. 3.1 kcal/g, 9 kcal/g, 6 kcal/g

D.

Answer: A

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277. Which of the following cells do not respire?

A. RBC

B. Sieve tube cell

C. Epidermal cell

D. Cork cell.

Answer: D

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278. RQ is less than one for

A. Carbohydrates are used as respiratory material

B. Organic acids are used as respiratory substances

C. Oxidation of respiratory substrate consume more O_2 than CO_2 released

D. Oxidation of respiratory substrate consume more O_2 tha CO_2 released

Answer: C

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279. Match the columns

	I		II
a	4 C Compound	1.	Acetyl CoA
b	2 C Compound	2.	Pyruvate
c	5 C Compound	3.	Citric acid
d	3 Compound	4.	α-ketoglutaric acid
		5.	Malic acid

A. a-2, b-5, c-3, d-1

B. a-5, b-1, c-4, d-2

C. a-3, b-1, c-4, d-2

D. a-5, b-3, c-1, d-2

Answer: B

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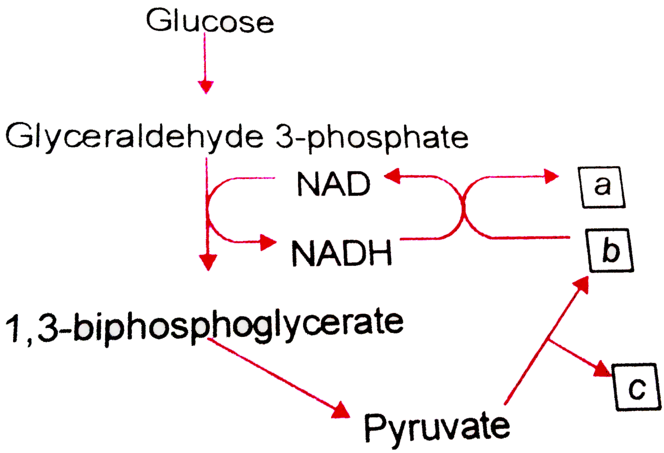
280. Choose the correct combination of labelling the molecules involved in the pathway of anaerobic respiration in Yeast



A. $a - ethanol, b - CO_2, c - ac\eta ldehyde$

B. $a - CO_2, b - ac\eta ldehyde, c - ethanol$

C. $a - CO_2, b - ethanol, c - ac\eta ldehyde$

D. $a - ethanol, b - ac\eta ldehyde, c - CO_2$

Answer: D

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281. In which of the following reactions of glycolysis, a molecule of water is removed from the substrate?

A. $2\text{-phosphoglycerate} \rightarrow PEP$

B. $PEP \rightarrow \text{Pyruvic acid}$

C. $\text{Glucose} \rightarrow \text{Gulcose 6-phosphate}$

D. $\text{Fructose 6- phosphate} \rightarrow \text{Fructose 1, 6-biphosphate}$

Answer: A

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282. In anaerobic respiration, 4 moelcules of glucose produce

A. 144 ATP

B. 20 ATP

C. 16 ATP

D. 8 ATP

Answer: D

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283. Phosphoglyceraldehyde is changed to biphosphoglyceric acid through

A. Carboxylation and hydration

B. Phosphorylation and oxidation

C. Decarboxylation and hydrogenation

D. Dephosphorylation and dehydrogenation.

Answer: B

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284. Oxalosuccinic acid, a transient intermediary compound of Krebs cycle is

A. 4-carbon compound

B. 5-carbon compound

C. 6-carbon compound

D. 3-carbon compound.

Answer: C

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285. The ratio of the volume of CO_2 evolved to the volume of O_2 consumed in respiration is called

A. $CQ \quad CO_2 / O_2$

B. $RQ \quad CO_2 / O_2$

C. $MQ \quad O_2 / CO_2$

D. $PQ \quad O_2 / CO_2$.

Answer: B

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286. Glyceraldehyde 3-phosphate (PGAld or GAP) is oxidised during glycolysis. What happens to the hydrogen atom and the electron that are removed during its oxidation ?

A. Oxidation of NAD^{+}

B. Reduction of NAD^{+}

C. Change in oxaloacetic acid

D. Formation of methane.

Answer: B

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287. A reaction catalysed by an enzyme not found in mitochondiral matrix

A. Conversion of pyruvic acid to acetyl CoA

B. Oxidative decarboxylation of α-ketoglutaric acid

C. Oxidation of succinic acid

D. Cleavage of succinyl CoA.

Answer: C

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288. 3-Phosphoglyceraldehyde is oxidised in glycolysis to form

A. 1,3-biphosphoglycerate

B. 3-phosphoglycerate

C. 2-phosphoglycerate

D. Phosphophenol pyruvate.

Answer: A

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289. Aerobic respiration occurs within the

A. Mitochondria

B. Peroxisomes

C. Cytoplasm

D. Cytoplasm and mitochondria.

Answer: D

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

A. Fructose

B. Glucose

C. Sucrose

D. Lactose.

Answer: B

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291. During strenuous exercise, glucose is converted into

A. Strach

B. Glycogen

C. Lactic acid

D. Pyruvic acid.

Answer: C

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292. Consider the following statements:

1. Copper is present in cytochrome oxidase.

2. Pantothenic acid is the precursor of coenzyme A.

3. Thiamine pyprophosphate is the prosthetic group in decarboxylases

4. Zinc is present in RNA and DNA polymerases

Which of these statements are correct?

A. 1, 2, 3 correct

B. 1, 2 correct

C. 2, 4 correct

D. 1, 3 correct.

Answer: B

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293. 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 cycle

D. Nitrogen cycle.

Answer: C

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294. Respiratory quotient (RQ) is equal to one in case of

A. Fatty acids

B. Carbohydrates

C. Nucleic acid

D. Organic acids.

Answer: B

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295. Cellular respiration first begins in

A. Cytoplasm

B. Carbohydrates

C. Nucleic acid

D. Organic acids.

Answer: A

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296. The enzyme that converts glucose into alcohol is

A. Invertase

B. Lipase

C. Zymase

D. Diastase.

Answer: C

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297. The chemiosmotic coupling hypothesis of oxidative phosporylaion process that adenosine triphoshate (ATP) is formed because

A. Proton gradient forms across inner membrane

B. Changed impermeability of inner mitochondrial membrane to ADP

C. High energy bonds are formed in mitochondrial proteins

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

Answer: A

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298. The energy -releasing metabolic process in which substrate is oxidsed without an external electron acceptor is called

A. Aerobic respiraton

B. Fermentation

C. Photorespiration

D. Glycolysis.

Answer: D

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299. Calorie is the unit of

A. Sound

B. Light

C. Heat

D. Temperature.

Answer: C

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300. Oxidative phosphorylation refers to :

A. Anaerobic production of ATP

B. Citric acid cycle production of ATP

C. Production acid cycle production of ATP

D. Alcoholic fermentaion.

Answer: B

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301. R.Q. would depend upon

A. Nature of enzymes

B. Nature of substrate

C. Amount of CO_2 released

D. Amount of O_2 utilised.

Answer: B

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302. Match the columns

	I		II
a	Oxaloacetate	p	6 C compound
b	Phosphoglyceraldehyde	q	5 C compound
c	Isocitrate	r	4 C compound
d	α-ketoglutarate	s	2 C compound
		t	2 c compound.

A. a-s, b-t, c-q, d-r

B. a-r, b-t, c-p, d-q

C. a-r, b-s, c-p, d-q

D. a-q, b-s, c-p, d-t.

Answer: C

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303. Which is correct for catabolism of 18 C fatty acid?

A. Mitochondria, beta oxidation, 148 ATP molecules

B. Mitochondria, beta oxidation, 140 ATP molecules

C. Cytosol, beta oxidation 146 ATP molecules

D. Cytosol, beta oxidation, 140 ATP molecules

Answer: A

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304. Direct ATP yield during Krebs cycle per glucose molecule is

A. 2

B. 8

C. 30

D. 38

Answer: A

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305. Which one of following is complex V of the ETS of inner mitochondrial membrane?

A. NADH dehydrogenase

B. ATP synthetase

C. Succinate dehydrogenase

D. Ubiquinone

Answer: B

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306. In which of the following parts of mitochondria, succinic dehydrogenase enzyme is located

" " Or

In mitochondria, enzyme cytochrome oxidase is present in

A. Perimitochondrial space

B. Outer membrane

C. Inner membrane

D. Matrix

Answer: C

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307. Aerobic respiratory pathway is appropriately termed

A. Anabolic

B. Catabolic

C. Amphibolic

D. Parabolic.

Answer: C

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308. Conversion of pyruvic acid to acetyl CoA is

A. Reductive carboxylation

B. Oxidative decarboxylation

C. Oxidative carboxlation

D. Reductive decarboxylation.

Answer: B

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309. Reduction of NAD does not occur in which of the following?

A. Pyruvic acid $\rightarrow$ Acetyl CoA

B. Isocitric acid $\rightarrow$ α-ketogulatric acid

C. Malic acid $\rightarrow$ Oxaloacetic acid

D. Succinic acid $\rightarrow$ Fumaric acid.

Answer: D

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310. How many PGAL are produced by glycolysis of three molecules of glucose ? How many ATP are released by respiration of these PGAL till formation of CO_2 and H_2O

A. 4 PGAL-40 ATP

B. 6 PGAL-120 ATP

C. 4 PGAL-80 ATP

D. 5 PGAL-160 ATP

Answer: B

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311. Final product of ETS of mitochondria is

A. H_2O

B. H^+

C. Electrons

D. All the above

Answer: A

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312. F_1 particle of oxysome

A. Releases proton energy

B. Utilises proton energy

C. Has no role in energy consumption

D. Lies in outer chamber.

Answer: B

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313. Which of the following respiratory substances requires the highest number of O_2 molecules for its complete oxidaiton.

A. Triolein

B. Oleic acid

C. Tripalmitin

D. Tartaric acid.

Answer: A

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314. Four respiratory enzymes are given below. Arrange them in increasing order of the carbon number of the substrates on which they act

Enolase (ii) Aconitase

(iii) fumerase (iv) Alcohol dehydrogenase

A. d, a, b, c

B. b, d, c, a

C. a, d, c, b

D. d, a, c, b.

Answer: D

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315. Pyruvate dehydrogenase complex needed for conversion of pyruvic acid to acetyl CoA is located in

A. Intermembrane space

B. Cytoplasm

C. Matrix of mitochondira

D. Grana of chloroplast.

Answer: C

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316. Which group of scientists discovered glycolysis

A. Embden, Merrison and Pitches

B. Embden, Meyerhof and Parnas

C. Emerson, Hoffman and Peterson

D. Avery, Macleod and Mc Carthy.

Answer: B

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317. ATP is synthesized in

A. Ion Channels

B. Plasmalemma

C. F_0 particles

D. F_1 particles.

Answer: D

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318. Which of the following membrane-bound complexes in mitochondria is not a proton pump?

A. Cytochrome b,c

B. Cytochrome c oxidase

C. NADH dehydrogenase

D. Succinate dehydrogenase.

Answer: D

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319. Which of the following is a biological uncoupler of oxidative phosphorylation

A. Thermogenin

B. 2, 4-Dichlorophenoxyacetic acid

C. 2, 4-Dinitrophenol

D. Ethylene diaminotetra-acetic acid.

Answer: A

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320. Which of the following is used as a cellular respiration indicator

A. Tetrazolium chloride

B. Ethanol

C. Schiff s reagent

D. Lactic acid.

Answer: A

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321. Citric acid cycle is.......step in carbohydrate metabolism

A. First

B. Second

C. Third

D. Fourth.

Answer: C

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322. Chemiosmosis was first described by

A. Boyer

B. Walker

C. Mitchell

D. Meischer.

Answer: C

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323. In Kreb's cycle OAA accepts acetyl CoA to form

A. Citric acid

B. Oxalosuccinate

C. Fumarate

D. Succinyl CoA

Answer: A

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324. In glycolytic pathway which of the following steps shows reduction of co-enzyme

A. 1,3-diphosphoglycerate to 3-phosphogly-create

B. Glucose 6-Phosphate to fructose 6-phosphate

C. 3-Phosphogylcerate to 2-phosphogylcerate

D. Glyceraldehyde 3-phosphate to 1-3, diphosphoglycerate.

Answer: D

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325. R.Q. for tripalmatin as respiratory substrate is

A. 0.7

B. 1

C. 0.9

D. ∞

Answer: A

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326. Which of the following is a 4-carbon compound?

A. Oxaloacetic acid

B. Citric acid

C. Phosphoglyceric acid

D. Phosphoenol pyruvate

Answer: A

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327. Yeast is

A. Rarely anaerobic

B. Anaerobic

C. Purely aerobic

D. Both aerobic and anaerobic

Answer: D

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328. Oxidative decarboxylation occurs during formation of

A. Citrate $\rightarrow$ Isocitrate

B. Pyruvic acid $\rightarrow$ Acetyl CoA

C. Succinate $\rightarrow$ Fumarate

D. Fumarate $\rightarrow$ Malate.

Answer: B

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329. Energy liberated during respiration is stored as

A. ATP

B. ADP

C. FAD

D. NADP.

Answer: A

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330. The energy -releasing metabolic process in which substrate is oxidsed without an external electron acceptor is called

A. Fermentation

B. Aerobic respiration

C. Photorespiration

D. Glycolysis.

Answer: D

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331. Which processes of Krebs' cycle are associated with both decarboxylations and dehydrogenation ?

A. Succinate $\rightarrow$ Fumarate, Fumarate $\rightarrow$ Malate

B. Malate $\rightarrow$ Oxaloacetate, Succinate $\rightarrow$ Fumarate

C. α-Ketoglutaric acid $\rightarrow$ Succinate, Malate $\rightarrow$ Oxaloacetate

D. Isocitrate $\rightarrow \alpha$-Ketoglutaric acid, α-ketoglutaric acid $\rightarrow$ Succinate.

Answer: D

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332. How many ATP molecules can be produced through oxidative phosphorylation of $2NADH_2$ and $3FADH_2$

A. 15

B. 24

C. 6

D. 12

Answer: D

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333. Second decarboxylation in TCA cycle occurs at

A. Pyruvate$\rightarrow$Acetyl CoA

B. α − Ketoglutarate $\rightarrow$ Succinyl CoA

C. Oxalosuccinic acid$\rightarrow$alpha-ketoglutarate

D. Malic acid $\rightarrow$ Fumaric acid.

Answer: B

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334. Connecting link between glycolysis and TCA cycle is

A. Pyruvate $\rightarrow$ Acetyl CoA

B. PGL $\rightarrow$ 1:3-diPGA

C. Citric acid $\rightarrow$ Isocitric acid

D. Malate $\rightarrow$ OAA.

Answer: A

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335. Turns of Krebs cycle required for complete oxidation of one molecule of glucose are

A. 2

B. 3

C. 4

D. 6

Answer: A

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336. Decarboxylation occurs during

A. Glycolysis

B. ETS

C. Krebs cycle

D. All the above

Answer: C

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337. ATP does not provide phosphate in the reaction

A. Glucose $\rightarrow$ Glucose 6-P

B. Fructose $\rightarrow$ Fructose 6-P

C. PGAL $\rightarrow$ 1:3-diPGA

D. PEPA $\rightarrow$ Pyruvic acid.

Answer: C

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338. In alcoholic fermentation, two molecules of glucose produce ethanol and CO_2 respectively

A. 2+2

B. 3+3

C. 4+4

D. 6+6

Answer: C

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339. In mitochondrial electron transport system, for every two pairs of electrons that pass from NADH molecules through a sequential series of cytochrome enzymes to molecular oxygen generate

A. 2 ATP

B. 3 ATP

C. 4 ATP

D. 6 ATP

Answer: D

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340. In citric acid cycle, the step not using dehydrogenase enzymes is

A. Malic acid to oxaloacetate

B. Succinate to fumarate

C. Oxaloacetate to citric acid

D. Citric acid to α-ketoglutarate.

Answer: C

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

A. 0.7

B. 1

C. 0.9

D. More than one.

Answer: C

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

A. Synthesis of ATP

B. Synthesis of $FADH_2$

C. Synthesis of NADH

D. Synthesis of NADPH.

Answer: A

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343. Substrate level phosphorylation in TCA occurs when

A. Succinate to malate

B. Succinyl CoA to succinate

C. Malate to Fumarate

D. Malate to oxaloacetate

Answer: B

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344. In the electron transport system present in the inner mitochondrial membrane, complexes I and IV are respectively

A. NADH dehydrogenase and $FADH_2$

B. $FADH_2$ and NADH dehydrogenase

C. NADH dehydrogenase and cytochrome oxidase complex

D. NADH dehydrogenase and ATP synthase

Answer: C

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345. Select the wrong statement

A. RQ is 0.7 with tripalmitin

B. Link compound between glycolysis and Krebs cycle is malic acid

C. 36 ATP molecules are produced per glucose molecule in aerobic respiration

D. 2 ATP molecules are produced per glucose molecule in anaerobic respiration

Answer: B

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346. Which of the following minerals activate the enzymes involved in respiration?

A. N and P

B. Mg and Mn

C. K and Ca

D. S and Fe

Answer: B

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347. Glycolysis

A. Occurs in mitochondria

B. Has no connection with ETC

C. Reduces 2 molecules of NAD^+ per glucose

D.

Answer: C

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348. In mitochondria, protons accumulate in the:

A. Outer membrane

B. Intermembrane space

C. Inner membrane

D. Matrix.

Answer: B

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349. After glycolysis, fate of glucose in mitochondrial matrix is

A. Hydrolysis

B. Oxidative decarboxylation

C. Reduction

D. Oxidation.

Answer: B

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350. Identify the membrane across which the proton (H^+) gradient facilitates ATP synthesis in a typical eukaryotic cell

A. Plasma membrane

B. Mitochondrial outer membrane

C. Mitochondrial inner membrane

D. Nulear membrane.

Answer: C

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351. How many ATP molecules will be generated in a plant system during complet oxidation of 40 molecules of glucose?

A. 3040

B. 380

C. 190

D. 1520

Answer: D

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352. Read the following four statements (A-D) -

(A) Both, photophosphorylation and oxidative phosphorylation involve uphill transport of protons across the membrane -

(B) In dicot stems, a new cambium originates from cells of pericycle at the time of secondary growth -

(C) Stamens in flowers of Glorisa and Petunia are polyandrous -

(D)Symbiotic nitrogen-fixers occurs in free-living state also in soil-

How many of the above statements are right?

A. One

B. Two

C. Three

D. Four.

Answer: B

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353. The number of molecules of pyruvic acid formed from one molecule of glucose at the end of glycolysis is

A. One pyruvic

B. Two pyruvic

C. Three pyruvic

D. Four pyruvic

Answer: B

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354. Consider the following statements with respect to respiration.

(i) Glycolysis occurs in the cytoplasm of the cell.

(ii) Aerobic respiration takes place within the mitochondria.

(iii) Electron transport system is present in the outer mitochondrial membrane.

(iv) $C_{51}H_{98}O_6$ is the chemical formula of tripalmitin, a fatty acid.

(v) Respiratory quotient $= \frac{\text{Volume of} O_2 \text{evolved}}{\text{Volume of} CO_2 \text{consumed}}$ of the above statements

A. a,b and d are correct

B. b, c and d are correct

C. c, d and e are correct

D. b,d and e are correct

Answer: A

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355. The first stable compound of Krebs cycle is

A. Acetyl CoA

B. Citric acid

C. Oxaloacetic acid

D. Fumaric acid.

Answer: B

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356. Select a suitable name for the following process

$$C_6H_{12}O_6 + 2ADP + 2\Pi \rightarrow 2C_2H_5OH + 2ATP + 2CO_2 \uparrow$$

A. Photorespiration

B. Lactate fermentation

C. Aerobic respiration

D. Alcoholic fermentaion.

Answer: D

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357. Chamiosmotic theory of ATP synthesis in chloroplast & mitochondria is based on

A. K^+ gradient

B. H^+ gradient

C. Na^+ gradient

D. Ca^{2+} gradient.

Answer: B

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

A. 36

B. 32

C. 30

D. 28

Answer: A

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359. Oxidation of one molecule of glucose in aerobic respiration produces

A. 2 ATP

B. 30 ATP

C. 36 ATP

D. 38 ATP

Answer: D

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360. TCA cycle is named after

A. Embden

B. Emerson

C. Krebs

D. Calvin.

Answer: C

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361. During movement of electron through ETC

A. Electron undergoes resonance

B. Electron undergoes fluorescence

C. Electron undergeos active transport

D. pH of matrix increases.

Answer: D

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362. 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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363. During EMP pathway, ATP is produced through

A. Oxidative phosphorylation

B. Cyclic phosphorlation

C. Substrate phosphorylation

D. None of the above

Answer: C

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364. Movement of ten electron from mitochondrial NADH molecules produces water molecules

A. 20

B. 15-

C. 10

D. 5

Answer: D

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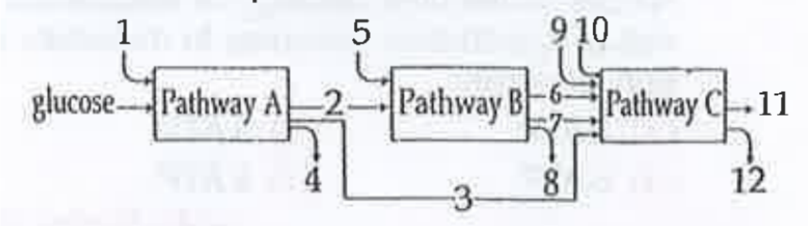
365. The three boxes in this diagram represent the three major biosynthetic pathways in aerobic respiration. Arrows represent net reactants or products.



Arrows numbered 4, 8 and 12 can all be

A. FAD or $FADH_2$

B. NADH

C. ATP

D. H_2O.

Answer: C

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366. Q.) Acetyl CoA is produced from pyruvate by

A. β-oxidation of fatty acids

B. Deamination of amino acids

C. Glycolysis

D. All the above

Answer: D

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367. How many six carbon organic acids occur in TCA cycle

A. 1

B. 3

C. 2

D. 4

Answer: B

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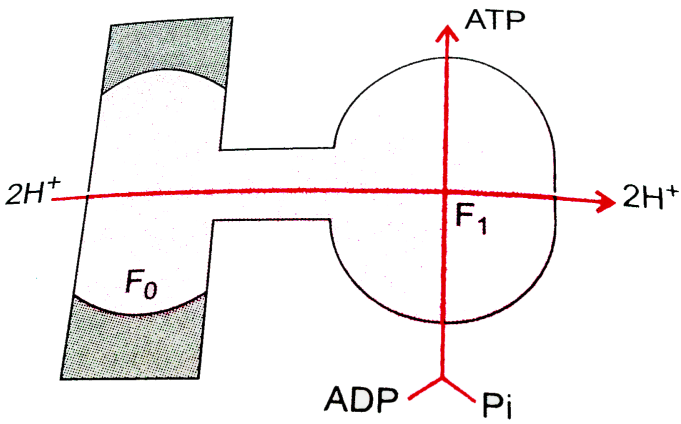
368. Which substance is present in F_1 head piece given in diagram



A. Peripheral membrane lipid complex

B. Peripheral membrane protein complex

C. Peripheral membrane glycolipid complex

D. Both A and B

Answer: B

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369. Oxidative decarboxylation occurs during formation of

A. Citric acid and succinic acid

B. Citric acid and oxaloacetic acid

C. Acetyl CoA and succinyl CoA

D. Oxaloacetic acid and oxalosuccinic acid.

Answer: C

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370. Given below is an electron acceptor. Mention its status which is labelled as a $Cyt^{++} \xrightarrow{2e} Cyt^{+++}a$

A. Oxidised

B. Reduced

C. Phosphorylation

D. Hydrated.

Answer: B

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371. What is respiratory quoient during germination of fatty seeds

A. Unity

B. Less than unity

C. More than unity

D. Zero

Answer: B

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372. Which one is amphibolic

A. Glycolysis

B. ETC

C. Gluconeogenesis

D. Krebs cycle

Answer: D

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373. Oxidation of one $NADH$ and one $FADH_2$ respectively gives rise to____and ____ATP molecules.

A. 2 and 3 ATP

B. 18 and 36 ATP

C. 36 and 18 ATP

D. 3 and 2 ATP

Answer: D

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374. Which stages of aerobic respiration take place in matrix of mitochondria

(i) Oxidative decarboxylation of pyruvic acid

(ii) Glycolysis

(iii) Krebs cycle

(iv) Oxidative phosphorylation

A. I and ii only

B. ii and iii only

C. iii and iv only

D. I and iii only

Answer: D

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375. Which is true of glycolysis

A. In aerobic organisms, it is the only process in respiration

B. In this process glucose undergoes complete oxidation to form pyruvic acid

C. Enzyme hexokinase catalyses phosphorylation of glucose to glucose 6-phosphate

D. ATP is utilised in conversion of PEP to pyruvic acid

Answer: C

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376. In Krebs cycle, OAA accepts acetyl CoA to form

A. Formaldehyde

B. Acetate

C. Isocitrate

D. Citrate.

Answer: D

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377. Identify correct pair of statements

(i) Attraction between two molecules of water present in oxylen channel is adhesion

(ii) Number of O_2 molecules absorbed is more than number of CO_2 molecules released when triolein is respiratory substrate

(iii) Bacillus mycodies is nitrifying bacteria

(iv) Continuous system of cell walls and intercullular spaces in plant tissues is called apoplast

1 ii and iii

2 iii and iv

3 ii and iv

4 I and iv.

A. ii and iii

B. iii and iv

C. ii and iv

D. I and iv.

Answer: C

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378. During aerobic respiration, acetyl CoA is synthesised in

A. Cytosol

B. Mitochondrial matrix

C. Perichondrial space

D. Glyoxysomal matrix.

Answer: B

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379. Which of the following acts as a mobile carrier for transfer of electrons between complex III and IV ?

A. Cyt a

B. Cyt b

C. Cyt c

D. Cyt d.

Answer: C

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380. During glycolysis, fructose 1, 6-biphosphate is split into

A. Dihydroxyacetone phosphate and 2-phosphoglyceraldehyde

B. Dihydroxy acetone phosphate and 1-phosphoglyceraldehyde

C. Dihydroxyacetone phosphate and 2-phosphoglyceraldehyde

D. Dihydroxyacetone phosphate and 3-phosphoglyceraldehyde.

Answer: D

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381. Respiratory quotient of glucose is

A. 0.5

B. 0.7

C. 1.0

D. 1.5

Answer: C

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382. Out of 36 ATP molecules produces per glucose molecules during respiration

A. P=2, Q=6, R=30

B. P=8, Q=6, R=24

C. P=8, Q=10, R=20

D. P=2, Q=12, R=24.

Answer: B

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383. Three major ways for metabolism of pyruvic acid produced in glycolysis are

A. Lactic acid fermentation, alcoholic fermentation and aerobic respiration

B. Oxaloacetic acid fermentation, lactic acid fermentation, aerobic fermentation, lactic acid fermentation, anaerobic fermentation

C. Alcoholic fermentation, oxaloacetic acid fermentation, citric acid fermentation

D. Citric acid fermentation, lactic acid fermentation, alcoholic fermentation.

Answer: A

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384. Assertion (A). RQ value for fats is less than one. Reason (R). The amount of CO_2 released is less than O_2 consumed when fats are used in respiration

A. A is true but R is false

B. A is false but R is true

C. Both A and R true and R is correct explanation of A

D. Both A and R are true but R is not the correct explanation of A.

Answer: C

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385. Identify the correct pair of statements

I. Niacin containing coenzymes facilitates the oxidation of malate in the matrix of mitchondria

II. Heam is the prosthetic group for the enzyme which catalyses the carboxylation of RuBP in the stroma of chloroplast,

III. The electron carrier between cyt c-oxidase and cyt-c-reductase is attached to inner membrane of mitochondria.

IV. Water spliting reaction in the lumen of thylakoid requires chlorine.

(a) I, II

(b) I, IV

(c) II, III

(d) III, IV

A. I, II

B. I, IV

C. II, III

D. III, IV

Answer: B

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386. Match the columns and choose the correct option

I	II
(a) Phosphoenol pyruvate (PEP)	p. 6-carbon compound
(b) Ribulose biphosphate (RuBP)	q. 2-carbon compound
(c) Oxaloacetic acid (OAA)	r. 4-carbon compound
(d) Acetyl CoA	s. 5-carbon compound
	t. 3-carbon compound

A. a-r, b-s, c-t, d-p

B. a-q, b-r, c-s, d-t

C. a-t, b-s, c-r, d-q

D. a-t, b-p, c-q, d-r

Answer: C

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387. The inner membrane of mitochondria is permeable to

A. Glucose

B. Fructose

C. Sucrose

D. ATP.

Answer: D

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388. How many NAD molecules get reduced in complete oxidation of one glucose molecule

A. 2

B. 5

C. 10

D. 12

Answer: C

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389. Enzyme enolase catalyses the conversion of 2-PGA to phosphoenol pyruvic acid in the presence of cofactor

A. Mn^{2+}

B. Fe^{2+}

C. Mg^{2+}

D. Zn^{2+}

Answer: C

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390. In which of the following steps of citric acid cycle, CO_2 is evolved

I. Citric acid $\rightarrow$ α-ketoglutaric acid.

II. Succinic acid $\rightarrow$ malic acid III. Malic acid $\rightarrow$ oxaloacetic acid IV. α-Ketoglutaric acid $\rightarrow$ succinyl CoA

A. I and II

B. I and IV

C. II and III

D. II and IV

Answer: B

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391. Oxidative decarboxylation of pyruvic acid results in the formation of

I. Acetyl CoA , II. CO_2

III. ATP , IV. $NADH + H^+$

A. I only

B. I and II only

C. I, II and III only

D. I, II and IV only

Answer: D

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392. Select the correct order of reactions in glycolysis

(a) 3-Phosphoglyceraldehyde $\rightarrow$ 1, 3-biphosphoglycerate

(b) 3-phosphoglyceric acid $\rightarrow$ 2-phospho-glycerate

(c) BPGA $\rightarrow$ 3-phosphoglyceric acid

(d) Splitting of 1, 6-fructose biphosphate to dihdroxy acetone phosphate and 3-phosphoglyceraldehyde

A. d, a, c, b

B. b, c, a, b

C. b, d, a, c

D. a, d, c, d

Answer: A

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393. CO_2 is not a byproduct in

A. Aerobic respiration in animals

B. Alcoholic fermentation

C. Lactate fermentation

D. Aerobic respiration in plants.

Answer: C

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394. Assertion : Glucose is favoured respiratory substrate.

Reason : When glucose is used as respiratory substrate and is completely oxidised, RQ is 1.

A. if both are true with reason being correct explanation

B. both true but reason is not correct explanation

C. assertion true but reason is wrong

D. both are wrong

Answer: A

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395. Which enzyme helps in transfer of phosphate group from ATP to a carbohydrate

A. Phosphatase

B. ATP ase

C. Phosphorylase

D. Catalase.

Answer: C

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396. During anaerobic respiration the conversion of pyruvate into acetaldehyde, along with co-enzyme TPP, the cofactor required is

A. Mg^{+}

B. Mn^{2+}

C. Fe^{2+}

D. Zn^{2+}

Answer: A

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397. Which process does the following equation represent

$C_6H_{12}O_6$ + 2NAD + 2ADP + 2Pi $\rightarrow$ $2CH_3$ - CO-COOH-2NADH_2 + 2ATP

A. Complete glycolysis

B. Complete aerobic respiration

C. Complete anaerobic respiration

D. Complete fermentation.

Answer: A

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398. Given below are some reactions and the enzymes involved. Identify the correct pairs.

	I		II
1.	Fructose 1,6 diphosphate $\rightarrow$ 3 PGAL + DHAP	A.	Enolase
2.	Citrate $\rightarrow$ Cis – aconitate	B.	Thiokinase
3.	Succinyl Co. A $\rightarrow$ Succinate	C.	Aconitase
4.	2 PGA $\rightarrow$ PEPA	D.	Aldolase

A. 1-d, 2-c. 3-b, 4-a

B. 1-a, 2-b, 3-c, 4-d

C. 1-b, 2-a, 3-d, 4-c

D. 1-c, 2-d, 3-a, 4-b

Answer: A

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399. How much of the energy released during aerobic respiration is approximately conserved in the form of ATP

A. 0.2

B. 0.4

C. 0.6

D. 1

Answer: B

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

A. Cytochrome c

B. Cytochrome a_3

C. Cytochrome b

D. $NADPH_2$

Answer: B

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401. Which of the following is the only 5-carbon compound formed during Krebs cycle

A. Malic acid

B. Succinic acid

C. cis-aconitic acid

D. α-ketoglutaric acid.

Answer: D

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402. When protein is aerobically oxidised, the R.Q. value will be

A. One

B. Zero

C. More than one

D. Less than one

Answer: D

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403. Which one has the lowest respiratory quotient

A. Glucose

B. Tripalmitin

C. Oxalic acid

D. Malic acid.

Answer: B

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404. Which one is the first compound which is common for both glucose and fructose in glycolysis

A. Fructose 6-P

B. Glucose 6-P

C. Fructose 1,6-biphosphate

D. Fructose 1-P.

Answer: A

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405. Which molecule links glycolysis with fermentation as well as TCA cycle

A. Ethanol

B. Acetaldehyde

C. PEP

D. Pyruvic acid.

Answer: D

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406. In which one of following reactions of glycolysis, oxidation takes place

A. Glucose 6-P to fructose 6-P

B. Fructose 6-P to fructose 1,6-biphosphate

C. 1,3-biphosphoglycerate to 3-phosphogl- yceric acid

D. 3-phosphoglyceraldehyde to 1, 3-bipho-sphoglycerate

Answer: D

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407. FAD is electron acceptor in citric acid cycle during the oxidation of

A. Malic acid to oxaloacetatic acid

B. Succinic acid to malic acid

C. Citric acid to α-ketogulatric acid

D. α-ketogulatric acid to succinic acid

Answer: B

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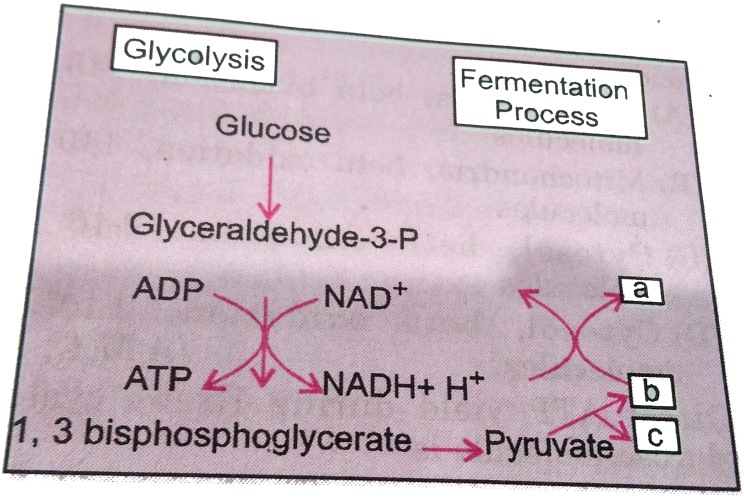
408. Choose the correct labelling



A. $a - CO_2$, b-ethanol, c-acetaldehyde

B. a-ethanol, b-acetaldehyde, $c - CO_2$

C. a-ethanol, $b - CO_2$, c-acetaldehyde

D. a-acetaldehyde, $b - CO_2$, c-ethanol.

Answer: B

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409. Conversion of pyruvic acid into ethyl alcohol is facilitated by :

A. Carboxylase

B. Phosphatase

C. Dehydrogenase

D. Decarboxylase and dehydrogenase.

Answer: D

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410. When the respiratory substances are more than one then which respiratory substrates are not used

A. Pure protein

B. Lipid

C. Carbohydrate

D. Both A and B

Answer: D

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411. During respiration........................

A. 2 PGAL during glycolysis and none in Krebs cycle

B. 2 PGAL during glycolysis and two pyruvic acid in Krebs cycle

C. 2 PGAL during glycolysis and 4 pyruvic acid in Krebs cycle

D. PGAL is not produced during respiratory events.

Answer: A

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412. Choose the correct sequence of electron pathway in ETS

A. Cyt oxidase $\rightarrow$ Cyt reductase $\rightarrow$ Succinate dehydrogenase $\rightarrow$ NAD dehydrogenase

B. NADH dehyrogenase $\rightarrow$ Succinate dehydrogenase $\rightarrow$ Cyt c reductase $\rightarrow$ Cyt. C oxidase

C. NADH dehydrogenase $\rightarrow$ Cyt c reductase $\rightarrow$ Cyt c oxidase $\rightarrow O_2$

D. Succinic dehydrogenase $\rightarrow$ Cyt oxidase $\rightarrow$ Cyt. Reductase $\rightarrow$ O_(2)`.

Answer: C

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413. Which of the two statements together support that respiratory pathway is an amphibolic pathway ,

(i) Fats breakdown to glycerol and fatty acids, subsequently yields acetyl CoA

(ii) In respiration C-C bonds of complex compounds breakdown through oxidation leading to release of energy

(iii) Acetyl CoA from respiratory pathway is withdrawn for synthesis of fatty acids

(iv) Proteins are degraded by protease to amino acids and enter the respiratory pathway

A. I, ii

B. I, iv

C. ii, iv

D. ii, iii

Answer: D

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414. Which one of the following electron acceptor is present in respiratory chain

A. Cytochrome f

B. Cytochrome a_3

C. Plastocyanin

D. Ferredoxin.

Answer: B

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415. In Krebs cycle guanosine triphosphate is formed during the conversion of

A. Isocitrate to oxalosuccinate

B. Oxalosuccinate to α-ketoglutarate

C. Succinyl CoA to succinate

D. Fumarate to malate

Answer: C

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416. How many glucose molecules are required for the formation of 52 pyruvic acid molecules at the end of glycolysis

A. 52

B. 46

C. 32

D. 26

Answer: D

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417. In anaerobic respiration, acetaldehyde is reduced to form alcohol by utilising $NADH_2$ obtained from

A. Glycolysis

B. Terminal oxidation

C. Krebs cycle

D. Acetylation.

Answer: A

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418. Function of electron transport chain in both mitochondria and chloroplasts is to develop

A. Mineral gradient

B. Proton gradient

C. Aqueous gradient

D. Protein gradient.

Answer: B

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419. Fatty acids are transported into mitochondria bound to

A. Thiokinase

B. Coenzyme A

C. Acetyl CoA

D. Carnitin.

Answer: D

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420. The coenzyme involved in oxidative decarboxylation is

A. Thiamine pyrophosphate

B. Biotin

C. NAD

D. Pyridoxal phosphate.

Answer: A

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421. Some desert beetles can survive on "metabolic water" without ever drinking liquid water which

A. Was produced as water in the organisms they eat

B. Is absorbed from the air alongwith respiratory oxygen

C. Is a breakdown product of pyruvate inside the mitochondria alongwith CO_2

D. Is a breakdown product from glycolysis in the cytoplasm.

Answer: C

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422. In the presence of of TPP and decarboxylase enzyme, pyruvic acid is converted into

A. Citric acid and CO_2

B. Acetaldehyde and CO_2

C. Ehtyl alcohol and CO_2

D. Acetic acid and CO_2

Answer: B

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423. What will be RQ of a substrate whose respiration equation is

$C_4H_6O_5 + 3O_2 \rightarrow 4CO_2 + 3H_2O$

A. 4/5=0.8

B. 5/4=1.25

C. 4/3=1.33

D. 3/4=0.75

Answer: C

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424. Pick up the reactions form the following where a water molecule is removed and reduction of NAD^+ does not occur in the reactions of respiration

(i) Succinic acid to fumaric acid

(ii) Malic acid to oxalacetic acid

(iii) 2-phosphoglycerate to phosphoenol pyruvic acid

(iv) Pyruvic acid to acetyl CoA

A. I, iv

B. I, ii

C. ii, iii

D. I, iii.

Answer: D

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425. In which of the following steps of citric acid cycle, CO_2 is evolved

I. Citric acid $\rightarrow$ α-ketoglutaric acid.

II. Succinic acid $\rightarrow$ malic acid III. Malic acid $\rightarrow$ oxaloacetic acid IV. α-Ketoglutaric acid $\rightarrow$ succinyl CoA

A. iv, I, ii, iii

B. I, iv, ii, iii

C. I, ii, iv, iii

D. I, iv, iii, ii.

Answer: B

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426. The net production of NADH molecules when 4 glucose molecules yeild 8 molecules of lactic acid through glycolysis and subsequenet fermantation is

A. Four

B. Eight

C. Zero

D. Two.

Answer: C

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427. Which of the following two enzymes catalye the release of CO_2 form the substrate

(i) α-ketogulatric acid dehydrogenase

(ii) Pyruvate dehydrogenase

(iii) Succinic thiokinase , (iv) Enolase

A. I, ii

B. iii, iv

C. I, iv

D. ii, iii

Answer: A

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428. In glycolysis during which reaction, water molecule is released

A. 2-Phosphoglyceric acid $\rightarrow$ Phosphoenol pyruvic acid

B. PGAL $\rightarrow$ 3PGA

C. 1,3-biphosphoglyceric acid $\rightarrow$ Phosphoglyceric acid

D. Phosphoenol pyruvic acid $\rightarrow$ Pyruvic acid.

Answer: A

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429. Match the columns and choose the right option

I		II	
(*a*)	Acetyl CoA	(*i*)	3-carbon compound
(*b*)	Malic acid	(*ii*)	6-carbon compound
(*c*)	Pyruvic acid	(*iii*)	4-carbon compound
(*d*)	Glucose	(*iv*)	2-carbon compound

A. a-ii, b-iv, c-iii, d-i

B. a-ii, b-iii, c-iv, d-i

C. a-iv, b-I, c-ii, d-iii

D. a-iv, b-iii, c-I, d-ii

Answer: D

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430. The respiratory quotient value of 0.9 is obtained for

A. Anaerobic respiration

B. Glucose

C. Proteins

D. Organic acids.

Answer: D

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431. In which one of the following steps of citric acid cycle, FAD is reduced to $FADH_2$

A. Pyruvate $\rightarrow$ Acetyl CoA

B. Succninc acid $\rightarrow$ Malic acid

C. Malic acid $\rightarrow$ Oxaloacetic acid

D. Citric acid $\rightarrow$ α-Ketoglutaric acid

Answer: B

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432. Which of the following biomolecules is common o respiration-mediated breakdown of fats, carbohydrates and proteins?

A. Acetyl CoA

B. Glucose 6-phosphate

C. Fructose 1,6-biphosphate

D. Pyruvic acid.

Answer: A

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433. Oxidativ phosphorylation is

A. Formation of ATP energy released from electrons removed during substrate oxidation

B. Formation of ATP by transfer of phosphate group from a sbustrate to ADP

C. Oxidation of phosphate group in ATP

D. Addition of phosphate group to ATP.

Answer: A

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434. The chemiosmotic coupling hypothesis of oxidative phosporylaion process that adenosine triphoshate (ATP) is formed because

A. A proton gradient forms across the inner mitochondrial membrane

B. There is change in the permeability of the inner mitochondrial membrane towards adenosine diphosphate

C. High energy bonds are formed in mitochondrial proteins

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

Answer: A

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435. Assertion : This conversion of 1,3-bishosphoglycerate (BPGA) to 3-phosphoglyceric acid (PGA) is an energy yielding step.

Reason : This energy is trapped by the formation of ATP

A. if both are true with reason being correct explanation

B. both true but reason is not correct explanation

C. assertion true but reason is wrong

D. both are wrong

Answer: B

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436. Which statement is wrong for Kreb's cycle?

A. There are three points in the cycle where NAD^+ is reduced to NADH + H^+

B. There is one point in the cycle where FAD is reduced to $FADH_2$

C. During conversion of succinyl CoA to succinic acid, a molecule of GTP is synthesised

D. The cycle starts with condensation of acetyl group with pyruvic acid to yield citric acid.

Answer: D

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Check Your Grasp

1. The tern zymosis was use for fermentation by

A. Buchner

B. Pasteur

C. Dutrochet

D. Kuhne.

Answer: A

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2. Which one is true ?

A. Fat respiration is a part of floating respiration

B. Fat is used as respiratory substrate only when carbohydrate supply has been consumed

C. Fat enters respiration through acetyl CoA and glycerophosphate

D. All the above

Answer: A

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3. R.Q. is zero in

A. Succulents

B. Germinating fatty seeds

C. Maturing fatty seeds

D. Anaerobic respiration.

Answer: A

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4. NADH is produced in

A. Dihydroxy acetone 3 - P $\rightarrow$ Glyceraldehyde 3-P

B. Glyceraldehyde 3-P $\rightarrow$ 1 : 3 diphosphoglyceric acid

C. Fructose 1 : 6 diphosphate $\rightarrow$ GaP + DiHAP.

D. Phosphenol pyrurate $\rightarrow$ Pyruvic acid.

Answer: A

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5. In respiration, substrate level phosphorylatin (direct ATP synthesis) occurs in the reaction

A. Dihydroxy acetone 3-P $\rightarrow$ Glyceraldehyde 3-P

B. 3-Phosphoglyceric acid $\rightarrow$ 2-Phospho-glyceric acid

C. 1, 3-bishosphoglyceric acid $\rightarrow$ 3-Phospho-glyceric acid

D. All the above

Answer: A

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6. $Cyta_3$ has

A. Fe and Mg

B. Cu and Mg

C. Fe and Cu

D. Fe, Mg and Cu.

Answer: A

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7. 5-carbon dicarboxylic compound of Krebs cycle is

A. Malate

B. Fumarate

C. Succinate

D. α-ketoglutarate.

Answer: D

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8. Enzyme aconitase of Krebs cycle is required to convert

A. Oxalosucinate to α-ketoglutarate

B. Citrate to isocitrate

C. Citrate to cis-aconitate

D. cis-aconitate to isocitrate.

Answer: A

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9. In the TCA cycle, $FADH_2$ is formed during

A. Succinate to fumarate

B. Fumarate to malate

C. Malate to oxaloacetate

D. Isocitrate to oxalosuccinate.

Answer: A

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10. Out of six protons extruded into outer mitochondrial chamber, only two are available form $NADH + H^+$. The others come form

A. $FADH_2$

B. $NADPH + H^+$

C. Matrix

D. Both A and B.

Answer: A

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11. Proton channel of oxysome is located in

A. F_1

B. F_0

C. ETC

D. Membrane pores.

Answer: A

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12. Metabolic water is the one

A. Produced in respiration

B. Required for hydrolysis

C. Produced during polymersation

D. Used in photolysis.

Answer: A

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13. Lactic acid is produced quite often in human

A. Red muscles

B. Cardiac muscles

C. Involutary muscles

D. White muscles.

Answer: A

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14. Extinction points is

A. Atomospheric oxygen where fire gets automatically extinguished

B. Concentration of oxygen below which aerobic respiration stops

C. Light intensity below which plant will not survive

D. Both B and C

Answer: A

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15. Switch over from anaerobic to aerobic mode of respiration is accompanied by reduction in consumption of respiratory substrate. The phenomenon is called

A. Warburg effect

B. Pasteur effect

C. Oxygen coefficient

D. Liebig's law.

Answer: A

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16. A climacteric fruit is

A. Trapa

B. Apple

C. Almond

D. Pistachio.

Answer: A

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17. Inner mitochondrial membrane is not permeable to

A. NADH

B. Pyruvate

C. Acetate

D. α-ketoglutarate.

Answer: A

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18. Aerobic respiration produces 264 gm of CO_2 per 180 gm of glucose. The amount of CO_2 produced for the same wieght of glucose in alcoholic fermentation shall be

A. 132 gm

B. 528 gm

C. 88 gm

D. Zero

Answer: C

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19. 60% of respiration in liver cells is performed through

A. Phosphogluconate shunt

B. Glycolysis

C. Anaerobic respiration

D. Common pathway.

Answer: A

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20. In hexose monophosphate shunt, glucose 6-phosphate undergoes

A. One dehydrogenation and one decarboxylation

B. Two dehydrogenations and one decarboxylation

C. Two dehydrogenations and two decarboxylations

D. Two dehydrogenations and three decarboxylations.

Answer: A

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