



BIOLOGY

COMPLETE CLASS 11TH + 12TH

RESPIRATION IN PLANTS

Check Your Concepts

1. How many steps of glycolysis are irreversible ?

A. 3 step \rightarrow 1st, 3rd and last

B. 3 step $\rightarrow 1^{st}, 5^{th}$ and last

C. 2 step $\rightarrow 1^{st}, 5^{th}$ and last

D. 1^{st} step only

Answer: A



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2. Acetyl-CoA can be formed from the breakdown of :

A. Carbohydrates only

B. Carbohydrates, fats and amino acids

C. Carbohydrates & fats only

D. Carbohydrates & amino acids only

Answer: B



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3. Which 5C compound may enter kreds cycle through oxidation of amino acids :

A. OAA

B. α - Ketoglutarate

C. Pyruvate

D. Succinyl CoA

Answer: B



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4. Which one of following vitamin is a precursor of FAD ?

A. Niacin

B. Riboflavin

C. Thiamine

D. Ubiquinone

Answer: B



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Exercise 1

1. Energy obtained by a cell from catabolic reaction is stored immediately in the form of

A. Pyruvic acid

B. Glucose

C. ATP

D. DNA

Answer: C



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2. Which component of ETS is mobile carrier ?

A. UQ (CO-Q)

B. Cyt -a

C. Cyto -b

D. Cyt -f

Answer: A



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3. R.Q is less than one at the time of respiration of-

A. Starch

B. Sugarcane

C. Glucose

D. Ground nut

Answer: D



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

A. 6

B. 3

C. 12

D. 15

Answer: B



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5. An example of competitive inhibition of an enzyme is the inhibition of

A. Succinic dehydrogenase by malonic acid

B. Cytochrome oxidase by cyanide

C. Hexokinase by glucose -6 phosphate

D. Carbonic anhydrase by carbon -dioxide

Answer: A



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6. Conversion of pyruvic acid into ethyl alcohol
is mediated by

A. Phosphatase

B. Dehydrogenase

C. Decarboxylase & dehydrogenase

D. Catalase

Answer: C



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7. The formation of Acetyl CoA from pyruvic acid is the result of its

A. Reduction

B. Dehydration

C. Phosphorylation

D. Oxidative decarboxylation

Answer: D



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

A. CO_2

B. Acetyl Co-A

C. Pyruvic acid

D. Citric acid

Answer: B



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9. Pyruvate dehydrogenase complex is usedc in converting

A. Pyruvate to glucose

B. Glucose to pyruvate

C. Pyruvic acid to lactic acid

D. Pyruvate to acetyl Co-A

Answer: D



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10. The first member of the TCA cycle is

A. Oxalo succinic acid

B. Oxalo acetic acid

C. Citric acid

D. Cis-aconitic acid

Answer: B



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11. Excess of ATP inhibits the enzyme

A. Phosphofructokinase

B. Hexokinase

C. Aldolase (Lyases)

D. Pyruvate decarboxylase

Answer: A



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12. End product of glycolysis is

A. Citric acid

B. Glyceraldehyde

C. Phosphoglyceraldehyde

D. Pyruvic acid

Answer: D



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13. The last or terminal cytochrome in respiratory chain is

or

In an electron transport chain in terminal oxidation the cytochrome which donates electrons to O_2 is

A. Cytochrome-b

B. Cytochrome-C

C. Cytochrome- a_3

D. Cytochrome-f

Answer: C



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14. Respiration in plants

A. Occurs only during day

B. Results in the formation of vitamins

C. Occurs both during day and night

D. Often requires CO_3

Answer: C



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15. The end products of respiration in plants are

A. CO_2 , H_2O and energy

B. Starch and O_2

C. Sugar and oxygen

D. H_2O and energy

Answer: A



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16. The incomplete breakdown of sugars in anaerobic respiration results in the formation of

Or

End product of anaerobic respiration is

Or

the end products of fermentation when sugars are used as raw material

A. Fructose and water

B. Glucose and carbon dioxide

C. Alcohol and CO_2

D. Water and CO_2

Answer: C



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17. Common immediate source of energy in cellular activity is

A. glucose

B. aldohexose

C. ATP

D. NAD

Answer: C



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18. The following is required both by the process of respiration and photosynthesis

A. Carbohydrates

B. Sunlight

C. Chlorophyll

D. Cytochromes

Answer: D



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19. The net gain of ATP molecules in glycolysis during aerobic respiration is

A. Zero

B. Two

C. Four

D. Eight

Answer: D



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20. Cytochromes are concerned with

A. Protein synthesis

B. Cellular digestion

C. Cell division

D. Cell-respiration

Answer: D



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21. In respiration pyruvic acid is

- A. Formed only when oxygen is available
- B. One of product of Krebs cycle
- C. Broken down into Acetyl Co-A and CO_2
- D. Oxidised into Alcohol

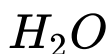
Answer: C



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22. Most of the energy of the carbohydrates is released by oxidation when

A. Pyruvic acid is converted into CO_2 and



B. Pyruvic acid is converted into acetyl Co-A

C. Sugar is converted into pyruvic acid

D. Glucose is converted into alcohol and



Answer: A



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23. Respiratory enzymes are located in

A. Ribosomes

B. Chloroplast

C. Mitochondria

D. none of the above

Answer: C



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24. Number of ATP molecules formed during aerobic respiration in break down of one glucose molecule via malate aspartate shuttle.

A. 38

B. 18

C. 28

D. 4

Answer: A



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25. The organism in which Kreb's cycle does not occur in mitochondria is

A. Yeast

B. E.coli

C. Ulothrix

D. Plants

Answer: B



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26. What causes R.Q. to vary?

A. Respiratory Substrate

B. Light & O_2

C. Respiratory Products

D. Temperature

Answer: A



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27. The first preferred respiratory substrate is

A. Glucose

B. Fats

C. Proteins

D. Polypeptide

Answer: A



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28. Respiration occurs in

A. All living cells both in lights & dark

B. Non green cells only in light

C. Non green cells in both light and dark

D. All living cells in light only

Answer: A



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29. The value of RQ of starved cell is

A. Zero

B. 0.9 / Less than one

C. 1 / unity

D. infinite

Answer: B



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30. RQ of an actively photosynthesizing tissue is

A. 1

B. < 1

C. > 1

D. Zero

Answer: A



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31. The respiratory Quotient(RQ) of a germinating castor seed is

A. 1

B. < 1

C. > 1

D. 0

Answer: B



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32. The value of RQ of a ripening fatty seed is

A. < 1

B. > 1

C. zero

D. Unity

Answer: B



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33. When production of CO_2 is more than intake of O_2 , the respiratory substrate is

- A. Fatty acid
- B. organic acid
- C. Glucose
- D. Polysaccharides

Answer: B



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34. Respiration may take place

- A. In the presence of O_2
- B. In the absence of O_2
- C. In the presence of absence of O_2
- D. In the presence of CO_2

Answer: C



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35. The common phase between aerobic and anaerobic respiration is called

- A. TCA cycle
- B. Krebs's cycle
- C. Glycolysis
- D. Photorespiration

Answer: C



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

- A. Phosphorylase
- B. Gluco-phosphorylase
- C. Hexokinase
- D. Phospho glucomutase

Answer: C



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37. Glycolysis give rise to

A. 8ATP, $2NADH_2$, 2 Pyruvate

B. 2ATP, 2CoA, $2NADH_2$

C. 2ATP, $2NADH_2$ 2Pyruvate

D. 2ATP, 2 acetate, $2NADPH_2$

Answer: C



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38. Which of the following ETS complex is inhibited by cyanide -

- A. Complex II
- B. Complex V
- C. Complex IV
- D. Complex III

Answer: C



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39. How many molecules of ATP are produced per molecule of $FADH_2$ oxidised ?

A. One

B. Two

C. Three

D. Four

Answer: B



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40. The full form of NAD is

- A. Nicotine adenosine diphosphate
- B. Nicotinamide adenosine dinucleotide
- C. Nicotinamide adenine dinucleotide
- D. Nicotinamide adenine diphosphate

Answer: C



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41. How many ATP molecules produced from the complete oxidation of a molecule of active acetate or acetyl Co-A?

A. 38 ATP

B. 15 ATP

C. 12 ATP

D. 4 ATP

Answer: C



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42. How many ATP equivalents are produced by the oxidation of succinate into fumarate ?

A. 1 ATP

B. 2 ATP

C. 3 ATP

D. 4 ATP

Answer: B



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43. Product formed by the activity of malic dehydrogenase is

- A. Fumaric acid
- B. Malic acid
- C. Oxaloacetic acid
- D. Succinic acid

Answer: C



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

A. Citric acid

B. Fumaric acid

C. Oxalosuccinic acid

D. α - ketoglutric acid

Answer: D



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45. First discovered Enzyme was

A. Isomerase

B. Transaminase

C. Zymase

D. Transferase

Answer: C



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46. Enzymes were discovered for the first time
in

A. Bacteria

B. Yeast

C. Algae

D. Spinach

Answer: B



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47. Who coined the term enzyme?

A. Pasteur

B. Buchner

C. Kuhne

D. Sumner

Answer: C



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48. Vitamin serves the function of :-.

- A. An enzyme
- B. A coenzyme
- C. A holoenzyme
- D. A hormone

Answer: B



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49. Which of the following is a coenzyme?

- A. NAD

B. NADP

C. FAD

D. All the above

Answer: C



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50. First enzyme to be isolated in pure crystalline form was

A. Catalase

B. Urease

C. Peroxidase

D. Amylase

Answer: D



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51. In plants enzymes are present in

A. Only in flowers

B. Only in leaves

C. All the living cells of plant body

D. Only in parenchyma

Answer: C



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52. Which of the following coenzyme is a derivative of pantothenic acid (vit -B complex) ?

A. NAD

B. NADP

C. FAD

D. Co-A

Answer: B



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53. Which of the following is not consumed in a biochemical process?

A. Hormone

B. Enzyme

C. Vitamin

D. Nucleotide

Answer: C



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54. How the presence of an enzyme affects the activation energy of a reaction?

A. It becomes increased

B. It becomes decreased

C. It is first increased and then decreased

D. Activation energy is not affected at all

Answer: B



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55. inhibition of succinate dehydrogenase by malonate is an example of

A. Competitive inhibition

B. Non competitive inhibition

C. Allosteric inhibition

D. Enzyme repression

Answer: D



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56. Enzyme inhibition caused by a substrate analogue is

A. Competitive

B. Non competitive

C. In competitive

D. Semi-competitive

Answer: A



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57. At boiling temperature an enzyme is

A. Denatured

B. Unaffected

C. Inactivated

D. Killed

Answer: A



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58. Enzymes have a very narrow optima for

A. Light

B. Temperature

C. pH

D. Humidity

Answer: C



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59. Substrate level net gain of ATP molecules during complete oxidation of 1 molecule of glucose

A. 8 ATP

B. 6 ATP

C. 4 ATP

D. 2 ATP

Answer: C



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60. How many net ATP generates in aerobic respiration via glycerol phosphate shuttle in eukaryotes

A. 38 ATP

B. 36 ATP

C. 40 ATP

D. 80 ATP

Answer: B



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61. There is gain of how many ATP in aerobic respiration of eukaryotic cell ?

A. 28 ATP

B. 38 ATP

C. 20 ATP

D. 40 ATP

Answer: B



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62. Cyanide resistant respiration is found in

A. Homo sapiens

B. Brassica

C. Spinach

D. Bacteria

Answer: C



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63. Direct gain of ATP from one molecule of glucose during glycolysis or EMP pathway

A. 2 ATP

B. 6 ATP

C. 36 ATP

D. 38 ATP

Answer: A



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64. Which enzyme is chemically not a protein?

A. Hexokinase

B. Synthetase

C. Endonuclease

D. Ribozyme

Answer: D



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65. Which enzyme break downs the fructose-1, 6Diphosphate ?

A. Hexokinase

B. Phosphatase

C. Aldolase

D. None

Answer: C



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66. Acceptor of acetyl Co-A in Krebs's cycle is

- A. Malic acid
- B. Fumaric acid
- C. α - ketoglutaric acid
- D. Oxalo aetic acid

Answer: D



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67. Exnzyme concerned with the transfer of electrons is

A. Hydrolasase

B. Dehydrogenase

C. Transaminase

D. Protease

Answer: B



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68. Anaerobic respiration takes place in

A. Ribosome

B. Nucleus

C. Cytoplasm

D. Vacuole

Answer: C



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69. During the formation of bread, it becomes porous due to release of CO_2 by the action of :

A. Yeast

B. Bacteria

C. Virus

D. Protozoans

Answer: A



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70. Allosteric enzymes have allosteric sites for

- A. Inhibition only
- B. Activation only
- C. Reduction in activation energy
- D. Both activation and inhibition

Answer: D



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71. Substrate concentration at which an enzyme attains half its maximum velocity is

- A. Half life of enzyme
- B. K_m -constant of enzyme
- C. Concentration ratio
- D. None

Answer: B



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72. In which one of the following do the two names refer to one and the same thing

A. Kreb's 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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73. In alcohol fermentation,

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

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

C. There is no electron donor

D. Oxygen is the electron acceptor

Answer: A





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74. In glycolysis, during oxidation electrons are removed by

A. Molecular oxygen

B. ATP

C. Glyceraldehyde

D. NAD^+

Answer: D



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75. During which stage in the complete oxidation of glucose are the greatest number of ATP molecules formed from ADP ?

- A. Conversion of pyruvic acid to acetyl Co A
- B. Electron transport chain
- C. Glycolysis
- D. Krebs cycle

Answer: B



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76. The deficiencies of micronutrients not only affects growth of plants, but also vital functions such as photosynthetic and mitochondrial electron flow. Among the list given below, which group of three elements shall affect the most, both photosynthetic and mitochondrial electron transport ?

A. Cu, Mn, Fe

B. Co, Ni, Mo

C. Mn, Co, Ca

D. Ca, K, Na

Answer: A



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77. 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 ions

D. Membrane potential

Answer: A



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78. which of the following statements regarding enzyme inhibiyion is correct ?

A. Non-competitive inhibition of an enzyme

can be overcome by adding large amount

of substrate

B. Competitive inhibition is seen, when a substrate competes with an enzyme for binding to an inhibitor protein

C. Competitive inhibition is seen, when the substrate and the inhibitor compete for the active site on the enzyme

D. Non-competitive inhibitors often bind to the enzyme irreversibly

Answer: C



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79. The catalytic efficiency of two different enzymes can be compared by the

- A. The K_m value
- B. The pH optimum value
- C. Formation of the product
- D. Molecular size of the enzyme

Answer: A



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80. Which is the site of Krebs cycle ?

A. Chloroplast

B. Golgi body

C. Mitochondria

D. Endoplasmic reticulum

Answer: C



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1. Sucrose is converted into glucose and fructose by enzyme :

A. Maltase

B. Amylase

C. Invertase

D. Hexokinase

Answer: C



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2. In lactic acid fermentation the final electron acceptor is

A. Acetaldehyde

B. Ethyl alcohol

C. $NADH + H^+$

D. Pyruvic acid

Answer: D



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3. RQ of protein is

A. 1

B. 0.7

C. 0.9

D. 0

Answer: C



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4. Glycerol would enter the respiratory pathway only after being converted to

A. Fatty acid

B. Acetyl CoA

C. PGAL

D. Pyruvic acid

Answer: C



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5. Final Decarboxylation in Krebs cycle occur between

- A. Citric acid and α -ketoglutaric acid
- B. α - ketoglutaric acid and succinic acid
- C. Succinic acid and malic acid
- D. Malic acid and oxalo acetic acid

Answer: B



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6. Pyruvate, which is formed by the glycolytic catabolism of carbohydrates in the cytosol, after it enters mitochondrial matrix, undergoes :

- A. Oxidative carboxylation
- B. Oxidative decarboxylation
- C. Reductive carboxylation
- D. Carboxylation

Answer: B



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7. Respiratory Quotient (RQ) value of tripalmitin is :

A. 0.7

B. 1.0

C. 1.3

D. 1.4

Answer: A



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8. During amphibolic pathways, Acetyl Co-A can perform the biosynthesis of :

- A. Amino acid
- B. Gibberellic acid
- C. Fatty acid
- D. All of the above

Answer: D



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9. During conversion of succinyl Co-A to succinic acid a molecule of GTP is formed, that is known as :

- A. Oxidative phosphorylation
- B. Substrate level phosphorylation
- C. Photophosphorylation
- D. Terminal oxidation

Answer: B



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10. In Glycolysis, glucose form two molecules of pyruvic acid, this is called :

- A. Complete oxidation
- B. Partial oxidation
- C. Photooxidation
- D. Terminal oxidation

Answer: B



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11. How many ATP molecules are directly synthesised in glycolysis?

A. 6ATP

B. 4ATP

C. 36ATP

D. 8ATP

Answer: B



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12. T.C.A. cycle is alternate term for :

A. Krebs cycle

B. Glycolysis

C. Calvin cycle

D. None

Answer: A



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13. When carbohydrates are used as substrate & anaerobically oxidised, the value of RQ will be :

A. 1

B. 0

C. ∞

D. less than 1

Answer: C



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14. Which act as final hydrogen acceptor in E.T.S.?

A. Oxygen

B. NAD^+

C. FAD

D. None

Answer: A



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15. Number of ATP produced when 1 molecule of pyruvic acid is used as respiratory substrate?

A. 15

B. 12

C. 3

D. 36

Answer: A



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16. Which of the following is the energy yielding step of glycolysis?

A. Glucose \rightarrow Glucose-6-phosphate

B. BPGA \rightarrow PGA

C. Fructose 1, 6 biphosphate \rightarrow PGAL

D. Phosphoglycerate \rightarrow
phosphoenolpyruvate

Answer: B



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17. The passing on of the electrons removed as part of the hydrogen atoms to molecular oxygen with synthesis of ATP, the site of this process located .

A. in the matrix of the mitochondria

B. in the cytoplasm

C. in the intermembrane space of mitochondria

D. on the inner membrane of the mitochondria

Answer: D



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18. In TCA cycle, isomerisation of citrate is followed by how many decarboxylation(s) to form succinic acid?

A. Two

B. Three

C. One

D. Four

Answer: A



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19. How many molecules of reduced coenzymes are produced inside mitochondria during complete oxidation of one glucose?

A. Five - $4NADH_2 + 1FADH_2$

B. Twelve - $10 NADH_2 + 2FADH_2$

C. Ten - $8 NADH_2 + 2FADH_2$

D. Four - $3 NADH_2 + 1FADH_2$

Answer: C



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20. In respiratory electron transport system, cytochrome 'b' receives electrons from :

- A. Ubiquinone
- B. Cytochrome C_1
- C. Cytochrome a_3
- D. Ubiquinol

Answer: D



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21. During oxidation within a cell, all the energy contained in respiratory substrate, is :

A. released free into cell

B. not converted into ATP

C. released in single step

D. released in cell and fully utilised in
synthesis of ATP

Answer: B



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22. In glycolysis there is no :-

- A. oxidation
- B. decarboxylation
- C. dehydrogenation
- D. splitting of C-C bonds

Answer: B



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23. After entry of pyruvic acid in mitochondrial matrix, which of the following does not take place?

A. oxidation

B. decarboxylation

C. oxidative -decarboxylation

D. ATP mediated phosphorylation

Answer: D



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24. What is the product of two decarboxylations and two oxidation of isocitric acid ?

A. α - ketoglutatic acid

B. Succinyl CoA

C. Succinic acid

D. fumaric acid

Answer: B



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25. What is incorrect about anaerobic respiration?

A. Partial breakdown of glucose

B. Net gain of 2ATP

C. Rapid oxidation of $NADH + H^+$ to NAD^+

D. Reduction of pyruvic acid

Answer: C



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26. Number of oxygen atoms required for aerobic oxidation of one pyruvate .

A. 5

B. 8

C. 10

D. 12

Answer: A

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27. in the process of respiration in plants 180 gms of sugar plus 192 gms of oxygen produce

A. 132 gm of CO_2 , 54 gm of H_2O & 483

Cal.E.

B. 264 gm of CO_2 , 108 gm of H_2O & 686

Kcal E.

C. 200 gm of C_2H_5OH , 72 gm of H_2O & 21

K.Cal E.

D. None

Answer: B



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28. At how many steps CO_2 is released in aerobic respiration ?

A. One or two

B. Three

C. Five

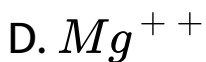
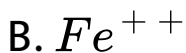
D. Twelve

Answer: B



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29. During glycolysis the main mineral needed as an enzyme activator is



Answer: D



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

- A. Photophosphorylation
- B. Hill reaction
- C. Oxidative phosphorylation
- D. β - oxidation

Answer: C



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31. By aerobic respiration of 1 molecule of PGAL how many ATP get synthesized considering glycerol phosphate shuttle .

A. 8ATp

B. 2 ATP

C. 19 ATP

D. 36 ATP

Answer: C



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32. $FADH_2$ produced in Kreb's cycle from : -

A. isocitrate

B. α - ketoglutarate

C. succinate

D. malate

Answer: C



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33. When 2 - pyruvic acids forms two lactic acid by anaerobic respiration then ?

A. One ATP is lost

B. 3 ATP is lost

C. 6 ATP is lost

D. None

Answer: C



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34. Aerobic respiration is how many times more useful than anaerobic respiration

- A. 2
- B. 8
- C. 19
- D. 38

Answer: C



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35. For retting of jute, the fermenting microbe used is

- A. *Helicobacter pylori*
- B. Methophilic bacteria
- C. *Streptococcus lactis*
- D. Butyric acid bacteria

Answer: D



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36. Enzymes, vitamins and hormones can be classified into a single category of biological chemicals, because all of these

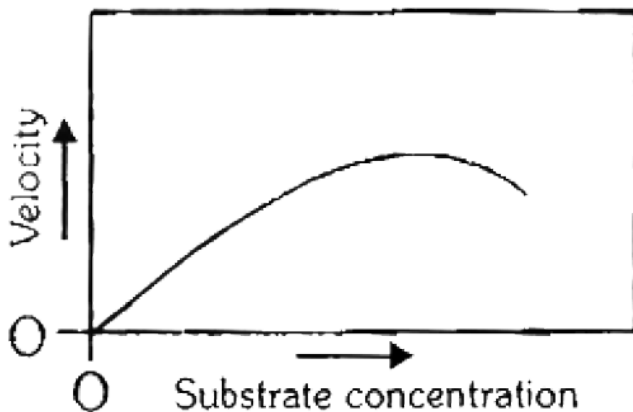
- A. enhance oxidative metabolism
- B. are conjugated proteins
- C. are exclusively synthesized in the body of a living organism
- D. help in regulating metabolism

Answer: D



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37. The graph given below shows the effect of substrate concentration on the rate of reaction of the enzyme green-gram-phosphatase. What does the graph indicate?



A. The rate of enzyme reaction is directly proportional to the substrate

concentration.

B. Presence of an enzyme inhibitor in the reaction mixture

C. Formation of an enzyme substrate complex

D. At higher substrate concentration the pH increases

Answer: D



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38. The step in which $NADH + H^+$ is not produced is : -

A. Succinyl-CoA \rightarrow Succinate

B. Pyruvate \rightarrow Acetyl-CoA

C. α - ketoglutarate \rightarrow Succinyl - CoA

D. Malate \rightarrow OAA

Answer: A



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39. Which intermediate of Krebs cycle is used as a substrate for amino acid biosynthesis :-

- A. Citric acid
- B. α - ketoglutarate
- C. Succinyl - CoA
- D. All of the above

Answer: B



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40. Which of the following is a common feature between glycolysis and Krebs cycles :

- A. Release of CO_2
- B. Formation of $FADH_2$
- C. Site of the processes
- D. Dehydrogenation

Answer: D



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41. Glycolysis is present in :-

- A. Plants and animal only.
- B. Plants, animals and fungi only.
- C. Animals only.
- D. All living organisms.

Answer: D



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42. How many molecules of CO_2 are released in Krebs cycle per glucose molecule ?

A. Two

B. Three

C. Four

D. Six

Answer: C



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43. The products formed from glycolysis are -

A. Pyruvate CO_2 , ATP

B. Pyruvate ATP , $NADH + H^+$

C. Acetyl CoA, ATP $NADH + H^+$

D. Acetyl CoA, ATP H_2O

Answer: B



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

A. OAA

B. α - ketoglutarate

C. Malate

D. PGAL

Answer: D



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45. How many $NADH + H^+$ are formed in per turn of Krebs cycle

A. Two

B. Three

C. Four

D. Five

Answer: B



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46. RQ is less than one for

- A. Proteins and organic acids
- B. Fatty acids and organic acids
- C. Fatty acids and proteins
- D. Proteins and carbohydrates

Answer: C



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47. The respiratory quotient depends upon the :

A. Type of respiratory substrate used during respiration

B. Amount of respiratory substrate used during respiration

C. Duration of respiration

D. Type of coenzymes used during respiration

Answer: A



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48. During alcoholic fermentation by yeast two molecules of glucose produce

A. 3 molecules of ethanol + 3 molecules of



B. 6 molecules of ethanol + 6 molecules of



C. 2 molecules of ethanol + 2 molecules of



D. 4 molecules of ethanol + 4 molecules of



Answer: D



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49. In mitochondrial ETS, cytochrome 'C' acts as a mobile carrier for transfer of electrons between :

A. Complex III and IV

B. Complex I and II

C. Complex II and III

D. Complex IV and V

Answer: A



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50. Which of the following statements is correct?

- A. All the proteins are enzymes
- B. All enzymes are proteins
- C. Almost all enzymes are proteins
- D. All enzymes are nucleic acids

Answer: C



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51. Low temperature preserves the enzyme in a ... 'A'... state whereas high temperature destroys enzymatic activity because proteins are .. 'B'... by heat. Choose the correct option :-

A. A = temporarily inactive, B = denatured

B. A = permanently inactive, B = temporarily inactive

C. A = permanently inactive, B = denatured

D. A = denatured, B = temporarily inactive

Answer: A



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52. Enzymes, which catalyse the transfer of hydrogen (H) between two substrates, are called :

A. Transferases

B. Oxidoreductases

C. Isomerases

D. Hydrolases

Answer: B



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Exercise 3

1. Curing of tea leaves is brought about by the activity of

A. viruses

B. fungi

C. bacteria

D. mycorrhiza

Answer: C



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2. Which of the following statements regarding mitochondrial membrane is NOT correct ?

- A. The inner membrane is highly convoluted forming a series of infoldings
- B. The outer membrane resembles a sieve
- C. The outer membrane is permeable to all kinds of molecules
- D. The enzymes of the electron transfer chain are embedded in the outer membrane.

Answer: D



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

A. 57

B. 1

C. 2

D. 30

Answer: A



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4. An organic substance bound to an enzyme and essential for its activity is called

A. Apoenzyme

B. Isoenzyme

C. Coenzyme

D. Holoenzyme

Answer: C



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

- A. Nucleic acids
- B. ATP in small stepwise units
- C. ATP in one large oxidation reaction
- D. Sugars

Answer: B



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

A. Succinate dehydrogenase

B. Lactate dehydrogenase

C. Isocitrate dehydrogenase

D. Malate dehydrogenase

Answer: A



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7. Which one of the following mammalian cells are not capable of metabolizing glucose to carbon dioxide aerobically ?

A. Red blood cells

B. White blood cells

C. Unstriated muscle cells

D. Liver cells

Answer: A



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8. A competitive inhibitor of succinic dehydrogenase is

A. α - Ketoglutarate

B. Malate

C. Malonate

D. Oxaloacetate

Answer: C



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9. The chemiosmotic coupling hypothesis of oxidative phosphorylation proposes that adenosine triphosphate (ATP) is formed because

A. A proton gradient forms across the inner membrane

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

C. High energy bonds are formed in mitochondrial proteins

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

Answer: A



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

A. Aerobic respiration

B. Glycolysis

C. Fermentation

D. Photorespiration

Answer: C



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11. In germinating seeds fatty acids are degraded exclusively in the

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

Answer: D



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12. Aerobic respiratory pathway is appropriately termed

- A. Parabolic
- B. Amphibolic
- C. Anabolic
- D. Catabolic

Answer: B



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

- A. Glycolysis
- B. Fermentation
- C. Aerobic respiration
- D. Photorespiration

Answer: B



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14. Three of the following statements about enzymes are correct and one is wrong. Which one is wrong

A. Enzymes are denatured at high temperatures but in certain exceptional organisms they are effective even at temperatures $80^{\circ} - 90^{\circ} C$

B. Enzymes are highly specific

C. Most enzymes are proteins but some are lipids

D. Enzymes require optimum pH for maximal activity

Answer: C



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15. In mitochondria, protons accumulate in the

A. Matrix

B. Outer membrane

C. Inner membrane

D. Intermembrane space

Answer: C



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16. For its activity, carboxypeptidase requires

A. Niacin

B. Copper

C. Zinc

D. Iron

Answer: B



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

A. Acetyl CoA

B. Glucose-6-phosphate

C. Fructose 1,6-bisphosphate

D. Pyruvic acid

Answer: D



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18. The essential chemical components of many coenzymes are

A. Vitamins

B. Proteins

C. Nucleic acids

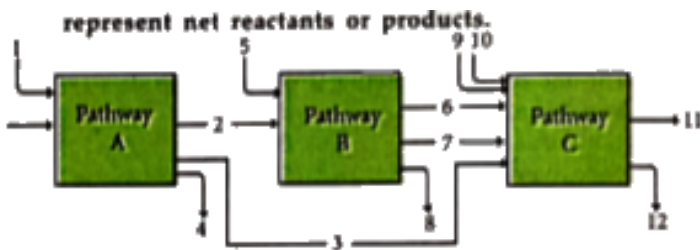
D. Carbohydrates

Answer: D



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



A. FAD^+ or $FADH_2$

B. NADH

C. ATP

D. H_2O

Answer: B



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20. In which one of the following processes CO_2 is not released

A. Aerobic respiration in plants

B. Aerobic respiration in animals

C. Alcoholic fermentation

D. Lactate fermentation

Answer: D



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21. Which of the following biomolecules is common to respiration-mediated breakdown of fats, carbohydrates and proteins

A. Acetyl CoA

B. Glucose-6-phosphate

C. Fructose 1,6-bisphosphate

D. Pyruvic acid

Answer: A



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22. Which statement is wrong for Krebs' cycle ?

A. There is one point in the cycle where

FAD^+ is reduced to $FADH_2$

B. During conversion of succinyl CoA to

succinic acid, a molecule of GTP is

synthesised

C. The cycle starts with condensation of

acetyl group (acetyl CoA) with pyruvic acid

to yield citric acid

D. There are three points in the cycle where

NAD^+ is reduced to $NADH + H^+$

Answer: C



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23. What is the role of NAD^+ in cellular respiration

- A. It is a nucleotide source for ATP synthesis
- B. It functions as an electron carrier
- C. It functions as an enzyme
- D. It is the final electron acceptor for anaerobic respiration

Answer: B



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24. Which of these statements is incorrect ?

A. Glycolysis operates as long as it is supplied with NAD that can pick up hydrogen atoms

B. Glycolysis occurs in cytosol

C. Enzymes of TCA cycle are present
mitochondrial matrix

D. Oxidative phosphorylation takes place
outer mitochondrial membrane

Answer: D



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25. Respiratory Quotient (RQ) value of
tripalmitin is :

A. 0.07

B. 0.09

C. 0.9

D. 0.7

Answer: D



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26. Match the following organisms with the products they produce:

- | | |
|-------------------------------------|-------------------|
| (a) <i>Lactobacillus</i> | (i) Cheese |
| (b) <i>Saccharomyces cerevisiae</i> | (ii) Curd |
| (c) <i>Aspergillus niger</i> | (iii) Citric Acid |
| (d) <i>Acetobacter acetic</i> | (iv) Bread |
| | (v) Acetic Acid |

- | | | | | |
|----|-----|-------|------|-----------|
| | (1) | (2) | (3) | (4) |
| A. | (A) | (iii) | (iv) | (v) (i) |
| | (1) | (2) | (3) | (4) |
| B. | (B) | (ii) | (i) | (iii) (v) |
| | (1) | (2) | (3) | (4) |
| C. | (A) | (ii) | (iv) | (v) (iii) |
| | (1) | (2) | (3) | (4) |
| D. | (A) | (ii) | (iv) | (iii) (v) |

Answer: B



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

A. Enolase

B. Phosphofructokinase

C. Aldolase

D. Hexokinase

Answer: D



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Exercise 4

1. Glycolysis is

- A. Anaerobic
- B. Aerobic
- C. Anaerobic and Aerobic both
- D. None

Answer: A



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2. Assertion :- During oxidation of respiratory substrate energy does not release in a single step.

Reason:- Breakdown of respiratory substrate in single step leads to unfavourable changes in cell temperature.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of

assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A



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3. Assertion :- Plants are devoid of specialised respiratory organs.

Reason:- Each plant part takes care of it's own gaseous exchange needs .

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A



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4. Assertion :- In plants there is no need of respiratory and Circulatory system.

Reason:- In plants most of the cells have at least a part of their surface in contact with air and an interconnected network of air spaces.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of

assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A



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5. Assertion :- Cells oxidise glucose and other respiratory substances not in one step, but in several small steps.

Reason:- Oxidation in multiple steps enabling

some steps to be just large enough such that the energy released can be coupled to ATP synthesis.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A



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6. Assertion :- Glycolysis is the oxidative process, while there is not utilisation of O_2 .

Reason:- In glycolysis redox equivalents are removed in form of hydrogen atoms.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A



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7. Assertion :- For complete breakdown of respiratory substrate Krebs cycle is essential.

Reason:- Krebs cycle is associated with step wise removal of all the hydrogen and CO_2 molecules

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A



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8. Assertion :- In Natural alcoholic drinks (beverages) alcohol level can never be exceed more than 13%.

Reason:- Beyond 13% alcohol concentration yeast poison themselves to death.

A. If both assertion and reason are true and reason is the correct explanation of

assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A



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9. Assertion :- Aerobic respiration yields more energy than anaerobic respiration.

Reason:- In aerobic respiration there is complete oxidation of organic substances in presence of oxygen and release all hydrogen and CO_2 .

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of

assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A



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10. Assertion :- Maximum two decarboxylations can occur in each turn of Krebs cycle.

Reason:- Acetyl CoA which enter as a substrate in Krebs cycle, is made up of two carbons.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A



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11. Assertion :- Ubiquinone is one of the important earlier of respiratory ETS.

Reason : - Ubiquinone helps in oxidation of both $NADH_2$ and $FADH_2$.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of

assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A



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12. Assertion :- Cytochrome-C is the mobile carrier.

Reason:- Cytochrome-C helps in transfer of electrons between complex IV and complex V.

- A. If both assertion and reason are true and reason is the correct explanation of assertion.
- B. If both assertion and reason are true but reason is not the correct explanation of assertion
- C. If assertion is true but reason is false.
- D. If both assertion and reason are false.

Answer: C



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13. Assertion :- Oxygen is vital for aerobic respiration.

Reason:- Oxygen drives whole process by removing hydrogen from the system.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of

assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A



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14. Assertion :- In ETS of respiration, oxidation of one carrier and reduction of another carrier is essential.

Reason:- In respiratory ETS, energy of oxidation

reduction utilised for production of proton gradient.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A



View Text Solution

15. Assertion :- The passage of protons through complex-V is coupled to production of ATP,

Reason:- Passage of protons through complex V is associated with breakdown of proton gradient which leads to release of energy for joining of ADP and P_i .

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A



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16. Assertion :- Calculation of the net gain of ATP for every glucose molecule oxidised, is a theoretical calculation.

Reason:- Owing breakdown of glucose sequential orderly functioning of pathway is not necessary.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A



View Text Solution

17. Assertion :- Fermentation accounts for only a partial breakdown of glucose.

Reason:- In fermentation there is no use of O_2 so final acceptor is any of the organic intermediate .

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A



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18. Assertion :- During fermentation oxidation of $NADH \rightarrow NAD^+$ is comparatively slow process than aerobic respiration.

Reason:- NADH arise during fermentation do not enter in ETC, it is to reduce the pyruvate or aldehyde.

- A. If both assertion and reason are true and reason is the correct explanation of assertion.
- B. If both assertion and reason are true but reason is not the correct explanation of assertion
- C. If assertion is true but reason is false.
- D. If both assertion and reason are false.

Answer: A



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19. Assertion :- Respiratory path is an amphibolic pathway rather than as a catabolic one,

Reason:- Respiratory pathway is involved in both anabolism and catabolism.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of

assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A



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