



BIOLOGY

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BIOLOGY (HINGLISH)

RESPIRATION IN PLANTS

Respiration In Plants

1. The energy releasing process in which the substrate is oxidised without an external acceptor is called or Lactic acid converted into alcohol in process called

A. Aerobic respiration

B. Glycolysis

C. Fermentation

D. Photorespiration

Answer: C



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2. During anaerobic conditions, the rate of glycolysis increases is called as or The process by which three in inhibition of aerobic respiration by atmospheric O_2 is

A. Compensation point

B. Extinction point

C. Warburg effect

D. Pasteur effect

Answer: D

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3. How many ATP molecules are obtained from fermentation of 1 molecule of glucose

A. 2

B. 4

C. 3

D. 5

Answer: A



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4. In anaerobic respiration, from one glucose molecule how many net ATP molecules are formed.

A. 2

B. 4

C. 6

D. 4

Answer: D



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5. Pasteur effect is concerned with the shifting of environmental conditions from

- A. Light to dark
- B. Aerobic to anaerobic
- C. Anaerobic to aerobic
- D. Light to anaerobic

Answer: C

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6. 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 CO_2

C. Alcohol and CO_2

D. Water and CO_2

Answer: C



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7. Which of the following plant is widely accepted to respire in absence of oxygen.

A. yeast

B. Potato

C. Chlorella

D. Grass

Answer: A



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8. Cyanide resistant pathway is

A. Anaerobic respiration

B. Aerobic respiration

C. Both a and b

D. none of these

Answer: A



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9. When a molecule of pyruvic acid is subjected to anaerobic oxidation and forms lactic acid, there is

A. Loss of 3 ATP molecules

B. Loss of 6 ATP molecules

C. Gain of 2 ATP molecules

D. Gain of 4 ATP molecules

Answer: A

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10. During cellulose fermentation by anaerobic bacteria in rumen and reticulum, cellulose is majority converted into

- A. lactic acid
- B. Ethyl alcohol
- C. Volatile fatty acids
- D. CO_2

Answer: C

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11. Fermentaion is

- A. Anaerobic respiratioin after glycolysis
- B. incomplete oxidtin of carbohydrates
- C. Complete oxidation of carbohydrates
- D. None of the above

Answer: A

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12. Which of the following minerals activate the enzymes involved in respiration.

- A. Nitrogen and phosphorus
- B. Magnesium and manganese
- C. Potassium and calcium
- D. Sulphur and iron

Answer: B



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13. During anaerobic respiration in yeast

- A. Water and CO_2 are end products

B. CO_2 , C_2H_5OH and energy are end products.

C. H_2S , $C_6H_{12}O_6$ and energy are the end products.

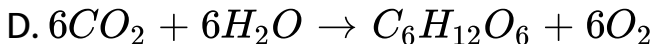
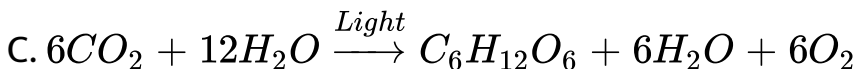
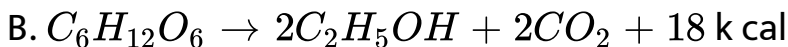
D. H_2O , CO_2 and energy are the only end products.

Answer: B



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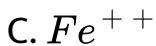
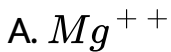
14. Fermentation is represented by the equation



Answer: B

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



Answer: A

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16. Continuous addition of sugars in 'fed batch' fermentation is done to

- A. Degrade sewage
- B. Produce methane
- C. Obtain antibiotics
- D. Purify enzymes

Answer: D



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17. Anaerobic products of fermentation are

- A. Alcohol and lipoprotein
- B. Ether and nucleic acid
- C. Protein and nucleic acid
- D. Alcohol, lactic acid and similar compound

Answer: D

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18. During lactic acid fermentation,.....

- A. O_2 is used, CO_2 is liberated
- B. Neither O_2 is used, nor CO_2 is liberated
- C. O_2 is used, CO_2 is not liberated

D. O_2 is not used, CO_2 is liberated.

Answer: B

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19. Anaerobic respiration was first of all reported by

A. Maguene

B. Kostychev

C. Klein

D. Pfeffer

Answer: B

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

- A. One molecule of ATP
- B. Two molecules of ATP
- C. Four molecules of ATP
- D. Eight molecules of ATP

Answer: B



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21. In fermentation, yeast secretes one of the following of enzymes

- A. Invertase
- B. Zymase
- C. Dehydrogenase
- D. Anolase

Answer: B



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22. Select a suitable name for the following process



A. Alcoholic fermentation

B. Photorespiration

C. Lactase fermentaion

D. Aerobic respiration

Answer: A



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23. Which of the following is the phosphorylating unit

A. Oxysome

B. Mesosome

C. Peroxisome

D. Mitochondria

Answer: A



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24. Aerobic respiratory pathway is appropriately termed

A. Catabolic

B. Parabolic

C. Amphibolic

D. Anabolic

Answer: C



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25. Which of the following show higher rate of respiration

- A. Collenchyma
- B. Leaf
- C. Dry seeds
- D. Germinating seeds

Answer: D



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26. how many ATP molecules will be generated in a plant system during complete oxidation of 40 moles of glucose

- A. 190
- B. 380
- C. 1520
- D. 3040

Answer: C

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27. Which one is product of aerobic respiration

- A. Malic acid
- B. Ethyl alcohol
- C. Lactic acid

D. Pyruvic acid

Answer: A



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28. The energy consumed during the conversion of ADP into ATP is

- A. 73000 cal/mole
- B. 686000 cal/mole
- C. 8000 cal/mole
- D. 7300 cal/mole

Answer: D



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29. Which of the substrate is used in protoplasmic respiration

- A. Fat
- B. Carbohydrate
- C. Protein
- D. All of the above

Answer: C



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30. 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: C



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31. Heat energy of plants is measured in

A. Grams

B. Pounds

C. Decibels

D. Calories

Answer: D



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32. 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

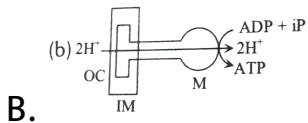
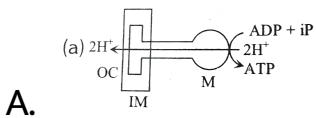
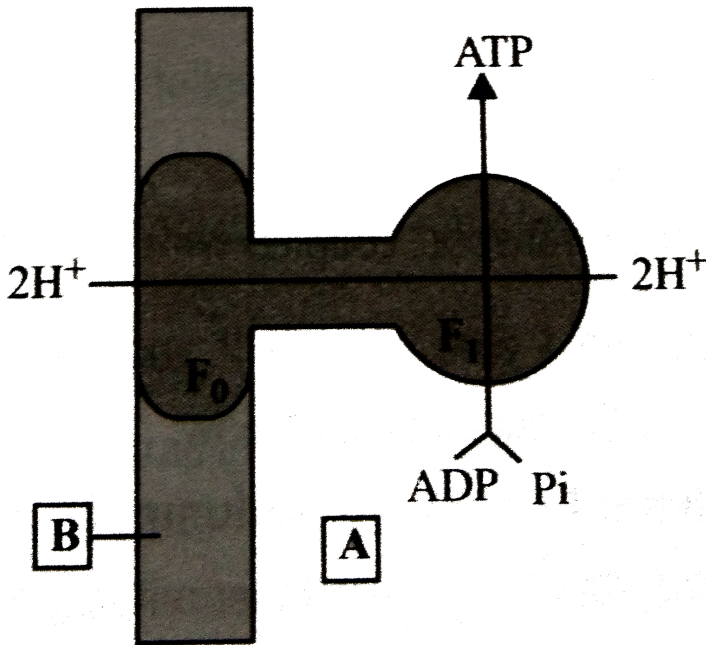
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33. Which of the following option is correct for photorespiration

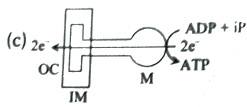
- A. In chloroplast, glycerate forms glycine
- B. In peroxisome, glycerate forms phosphoglycolate
- C. In mitochondrion, glycine forms serine
- D. In bundle sheath, serine from glycine

Answer: C

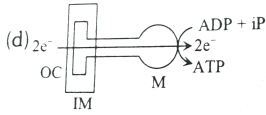
34. Identify A and B in the given diagram showing ATP synthesis in mitochondria.



C.



D.



Answer: B

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35. In carbon dioxide reduction ATP is

A. Used

B. Unused

C. May be used or not used

D. None

Answer: A

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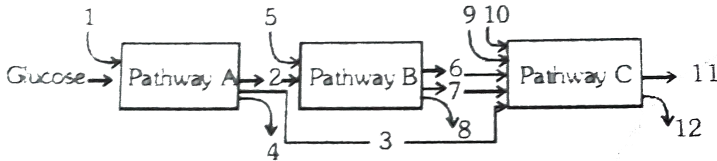
36. In submerged hydrophytes entry of CO_2 is through

- A. Epidermis as dissolved CO_2
- B. Epidermis as carbonates only
- C. Epidermis as bicarbonates only
- D. Both b and c

Answer: D

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



Arrow

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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38. Respiration differs from the process of combustion in the fact that

- A. All the energy stored in glucose is released at once due to combustion and enzymes are involved
- B. All energy stored in glucose is gradually released due to combustion
- C. Comparatively large quantity of energy is produced due to combustion
- D. The carbohydrate act as the combustion substances.

Answer: A



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39. Adenosine diphosphate contains

- A. One high energy bond
- B. Two high energy bond
- C. Three high energy bond
- D. Four high energy bond

Answer: A



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40. "Mitchell's chemiosmotic theory" belongs to

- A. Kreb's cycle

B. Oxidative phosphorylation

C. Glycolysis

D. None of the above

Answer: B



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41. Which of the following is involved in the catalysis of link reaction during aerobic respiration.

A. Vitamin A

B. Vitamin B_1

C. Vitamin B_6

D. Vitamin K

Answer: B

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42. Ganong's respiroscope is used to demonstrate.....

A. Production of carbon dioxide during aerobic respiration

B. Production of heat during aerobic respiration

C. Evolution of oxygen during photosynthesis

D. Evolution of carbon dioxide during fermentation

Answer: A



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43. ATP was discovered by

A. Blackman

B. Bowman

C. Lipman

D. Karl Lohman

Answer: D



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44. Mechanism of aerobic respiration was discovered by

A. Krebs's

B. Calvin

C. Hatch and Slack

D. Pasteur

Answer: A



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45. Cell respiration (internal Respiration) is carried out by
Aerobic respiration which yields maximum ATP molecule is
completed on

- A. Ribosome
- B. Mitochondria
- C. Chloroplast
- D. Golgi Bodies.

Answer: B

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46. In Mitochondria, Cristae act as sites for

- A. Protein synthesis
- B. Oxidation-reduction reactions (respiration)
- C. Breakdown of macromolecules

D. Phosphorylation of flavoproteins

Answer: B



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47. Which of the following forms the connecting link between glycolysis and Krebs's cycle.

A. Glucose

B. Ethyl alcohol

C. Lactic acid

D. Pyruvic acid

Answer:

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48. Enzymes related with cristate are related with

- A. Anaerobic respiration
- B. Aerobic respirtion
- C. CO_2 formation
- D. Reduction of pyruvic acid

Answer: B

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49. Which of the following is a more accurate statement about respiration

- A. O_2 must always be available for respiration
- B. O_2 combines with carbon to form CO_2
- C. O_2 combines with hydrogen to form H_2O
- D. Air is inhaled and exhaled only from stomata

Answer: C

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50. In the respiratory process, energy is released and is used to synthesis energy rich molecules of ATP from ADP,

thereby storing energy for future use. This process of output of these molecules in the aerobic phase is known as

- A. Krebs's cycle
- B. Glycolysis
- C. Phosphorylation
- D. Ornithine cycle

Answer: C

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51. How many ATP are formed from $NADPH^+$ to NAD^+

- A. 2 ATP

B. 3 ATP

C. 6 ATP

D. 4 ATP

Answer: B



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52. An ATP molecule is structurally most similar to a molecule of

A. RNA molecule

B. DNA molecule

C. Amino acid

D. Fatty acid

Answer: A



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53. Aerobic respiration is called

A. Fermentation

B. Chemosynthesis

C. Bio-oxidation

D. Photorespiration

Answer: C



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54. Which of the following is utilized first in respiration

- A. Fat
- B. Protein
- C. Sucrose
- D. Hexose

Answer: D



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55. Degradation of sugar and fat to Acetyl CoA will not take place if the following organelle is not present in a

eukaryotic cell

A. Golgi apparatus

B. Mitochondrion

C. Ribosome

D. Nucleus

Answer: B



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56. Salt respiration is also called as

A. Anion respiration

B. Cation respiration

C. Photorespiration

D. None of the above

Answer: A



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57. Leaves of annual plants obtain O_2 through

A. Cell walls

B. Cuticle and leaf scars

C. Stomata

D. Lenticels

Answer: C



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58. Respiratory exchange in seeds occur through

- A. Testa
- B. Stomata
- C. Micropyle
- D. Hilum

Answer: C



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59. The aerobic respiration yields

A. 8NADH_2 , 2FADH_2 , 2ATP

B. 10NADH_2 , 2FADH_2 , 38ATP

C. 12NADH_2 , 30ATP , H_2O

D. 10NADH_2 , 2FADH_2 , 2GTP , 2ATP

Answer: D



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60. Protein is used as respiratory substrate only when

A. Carbohydrates are absent

B. Fats are absent

C. Both exhausted

D. Fats and carbohydrates are abundant

Answer: C

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61. Which of the scientific paper would you assign to plant physiology

- A. Evergreen forest of India
- B. Embryo culture of plants
- C. Respiratory activities in plants
- D. Cell and cell division

Answer: C



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62. Chemiosmotic mechanism of ATP synthesis was proposed by

A. Warberg

B. Dickens

C. Kreb's

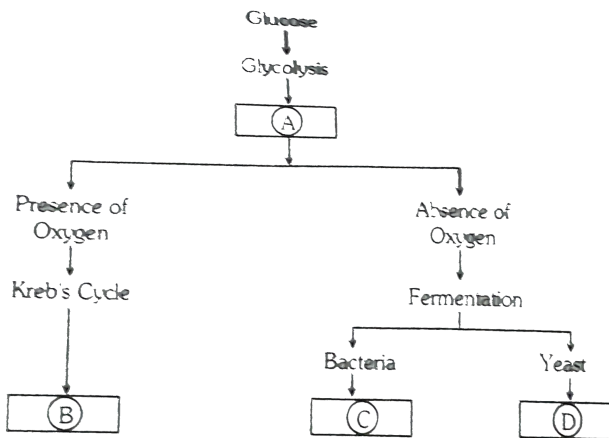
D. P.Mitchell

Answer: D



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63. The following is a simplified scheme showing the fate of glucose during aerobic and anaerobic 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=carbon dioxide and water, B= pyruvic acid, C= ethyl alcohol and carbon dioxide, D=lactic acid

B. A = pyruvic acid, B=carbon dioxide and water, C=lactic acid, D=ethyl alcohol and carbon dioxide

C. A= pyruvic acid, B=carbon dioxide and water, C=ethyl alcohol and carbon dioxide, D=lactic acid

D. A=pyruvic acid, B=ethyl alcohol and carbon dioxide, C=lactic acid, D=carbon dioxide and water

Answer: B



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64. The rate of respiration could be checked by

A. Malonate

B. CO_2

C. Chloroform and cyanides

D. All the above

Answer: D



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65. If a starved plant is provided with glucose, the rate of respiration would

A. Decrease

B. Increase

C. Become constant

D. First rise and then all

Answer: B

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66. The high-energy bonds of ATP are between

A. C-C

B. C-O

C. C-N

D. O-P

Answer: D

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67. Respiration initiated in chloroplasts and occurs in light is called

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

Answer: C



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68. Which of the following is formed during respiration

A. O_2 (Oxygen)

B. CO_2 (Carbon dioxide)

C. NO_2 (Nitrogen dioxide)

D. SO_2 Sulphur dioxide

Answer: B



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69. From substrate level phosphorylation ATP are produced

A. 2

B. 6

C. 10

D. 8

Answer: B

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70. The net gain of energy, from one molecule of sucrose in aerobic respiration, is

A. 18 ATP

B. 38 ATP

C. 60 ATP

D. 76 ATP

Answer: D

71. Common immediate source of energy in cellular activity or Energy currency of the cell is

Or

To a living organism which of the following has the greater amount of available energy per molecule

A. DNA

B. ATP

C. RNA

D. NAD

Answer: B

72. Make suitable pairing

- A) Glycolysis, a) Mitochondria
- B) Krebs's cycle, b) Cytoplasmic matrix
- C) Electron transport chain

A. Aa, Ba, Cb

B. Ab, Ba, Ca

C. Aa, Bb, Cb

D. Ab, Bb, Ca

Answer: B



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73. The net gain of energy from one gram molecule of glucose during aerobic respiration is

Net gain of ATP in prokaryotes is as high as 300 parts per million

- A. All plants will be killed
- B. The plants would not grow properly
- C. Plants would grow for some time and then die
- D. The plants would thrive well

Answer: C

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74. Different steps in respiration are controlled by

A. Auxin

B. Sugar

C. Enzyme

D. Kinetin

Answer: D



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75. Aerobic respiration is obtained from

A. Auxin

B. Sugar

C. Enzyme

D. Kinetin

Answer: C



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76. Highest calories is obtained from

A. Fats

B. Protiens

C. Carbohydrates

D. Vitamins

Answer: A



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77. Aerobic respiration of glucose produces energy

A. 637 kcal

B. 640 kcal

C. 673 kcal

D. 693 kcal

Answer: C



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78. Cytochrome is related to

A. Cellular digestion

B. Protein synthesis

C. Cell division

D. Cellular respiration

Answer: D



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79. Energy given by one molecule of ATP is

A. 7.3 kcal

B. 721 kcal

C. 760 kcal

D. 1000 kcal

Answer: A



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80. Respiration is an

- A. Endothermic process
- B. Exothermic process
- C. Anabolic process
- D. Endergonic process

Answer: B



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81. Who among the following can be said to be the "Father of Indian Physiology"

A. B.P. Pal

B. K.C. Mehta

C. M.S Swaminathan

D. J.C. Bose

Answer: D



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82. The energy yield as a result of total oxidation of one glucose molecule during cellular respiration is to convert

- A. 38 molecules of ADP into 38 molecules of ATP
- B. 30 molecules of ADP into 30 molecules of ATP
- C. 36 molecules of ADP into 36 molecules of ATP
- D. 32 molecules of ADP into 32 molecules of ATP

Answer: A

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83. Cut surfaces of fruit and vegetables often becomes dark because

- A. Dirty knife makes it dark

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

Answer: B

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- 84.** Oxidative phosphorylation occurs during the process of
- A. Protein synthesis
- B. N_2 fixation
- C. Respiration

D. Transpiration

Answer: C



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85. Which of the following forms the connecting link between glycolysis and Krebs's cycle.

A. Pyruvic acid

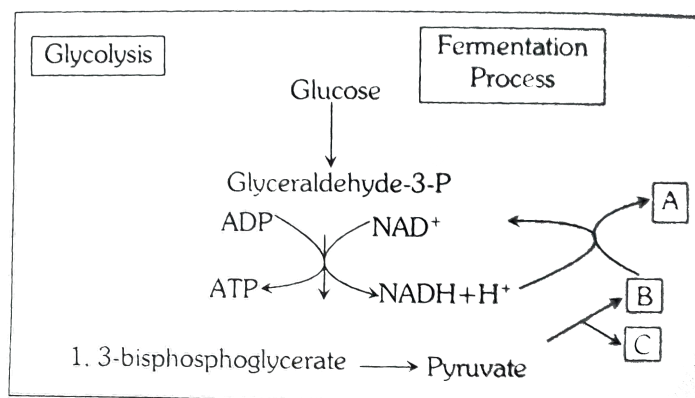
B. Acetyl CoA

C. Acetaldehyde

D. Citric Acid

Answer: B

86. Choose the correct combination of labelling the molecules involved in the pathway of anaerobic respiration in yeast



A. A-Ethanol , B- CO_2 , C- Acetaldehyde

B. A- CO_2 , B-Ethanol,C-Acetaldehyde

C. A- CO_2 , B-Acetaldehyde, C-Ethanol

D. A-Acetaldehyde, B- CO_2 , C-Ethanol

Answer:



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87. In which of the following reaction of glycolysis, a molecule of water is removed from the substrate

A. Fructose -6-phosphate \rightarrow fructose 1,6-bisphosphate

B. 3-phosphate glyceraldehyde \rightarrow 1,3 -
bisphosphoglyceric acid

C. PEP to pyruvic acid

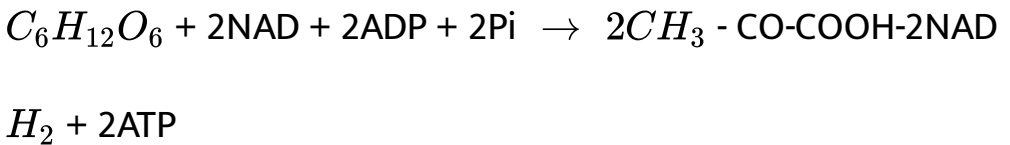
D. 2-Phosphoglycerate to PEP

Answer: D



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88. Which process does the following equation represent



- A. Complete glycolysis
- B. Complete aerobic respiration
- C. Complete anaerobic respiration
- D. Complete fermentation

Answer: A



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89. How many ATP are used in glycolysis or for complete phosphorylation of a glucose molecule, how many ATP molecules are required

Or

The net gain of ATP during glycolysis is

A. 4

B. 2

C. 6

D. 8

Answer: B



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90. Which of the following substances yield less than 4 Kcal/mol when its phosphate bond is hydrolysed

- A. Creatine phosphate
- B. ADP
- C. Glucose-6-phosphate
- D. ATP

Answer: C



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91. Which is not true for glycolysis

- A. End product is CO_2 , H_2O
- B. Substrate level phosphorylation
- C. Production of ATP
- D. Expenditure of ATP

Answer: A

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92. Glycolysis term has originated from Greek words

- A. Glycose and lysis
- B. Glycos and lysis
- C. Glusco and lysis

D. Glucose and lysis

Answer: B

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93. Consider the following statements with respect to respiration

A. Glycolysis occurs in the cytoplasm of the cell

B. Aerobic respiration takes place within the mitochondria

C. Electron transport system is present in the outer mitochondrial membrane

D) $C_{51}H_{98}O_5$ is the chemical formula of Tripalmitin, a fatty acid

E) Respiratory quotient = (Volume of O_2 evolved)/(Volume of CO_2 consumed) of the above statements.

- A. A,B and D alone are correct
- B. B, C and E alone are correct
- C. C,D and E alone are correct
- D. B,D and E alone are correct

Answer: A

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94. Decarboxylation is not involved in

- A. Electron transport system

B. Glycolysis

C. Krebs's cycle

D. Alcoholic fermentation

Answer: B



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95. Which one is correct sequence in glycolysis

A. G 6-P \rightarrow PEP \rightarrow 3-PGAL \rightarrow 3-PGA

B. G6-P \rightarrow 3-PGAL \rightarrow 3-PGA \rightarrow PEP

C. G6-P \rightarrow PEP \rightarrow 3-PGA \rightarrow 3-PGAL

D. G6-P \rightarrow 3-PGA \rightarrow 3-PGAL \rightarrow PEP

Answer: B



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96. In glycolysis, during oxidation electrons are removed by

A. NAD^+

B. Molecular oxygen

C. ATP

D. Glyceraldehyde-3-phosphate

Answer: A



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

A. 1,3-diphosphoglycerate to 3-phosphoglycerate

B. Glucose 6-phosphate to fructose 6-phosphate

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

D. 3-Phosphoglycerate to 2-phosphoglycerate

Answer: C

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98. First stage in respiration is

A. Aerobic oxidation of pyruvic acid

B. Liberation of CO_2

C. Glycolysis

D. Electron transport system

Answer: C



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99. Besides the net gain of 2ATP molecules in glycolysis which other molecules are simultaneously formed

A. $FADH_2$

B. $NADPH_2$

C. NADH_2

D. FAMH_2

Answer: C

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100. Which of the following is the product of phosphorylation

A. PGA

B. Fructose 1, 6 diphosphate

C. DPGA

D. Pyruvic acid

Answer: B



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101. In glycolysis, the end product is

- A. Protein is converted to glucose
- B. Glucose is converted into fructose
- C. Starch is converted into glucose
- D. Glucose is converted into pyruvic acid

Answer: D



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102. Total ATP production during EMP pathway is

- A. 24 ATP molecules
- B. 8 ATP molecules
- C. 38 ATP molecules
- D. 6 ATP molecules

Answer: B



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103. Glycolysis (EMP pathway) takes place in

Or

Anaerobic respiration takes place in the

A. Mitochondria

B. Cytoplasm

C. Both mitochondria and cytoplasm

D. Vacuole

Answer: B



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104. Which one of the following is the first step of glycolysis

A. Breakdown of glucose

B. Phosphorylation of glucose

C. Conversion of glucose into fructose

D. Dehydrogenation of glucose

Answer: B



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105. Glycolysis occurs in

A. Generally in all the cells

B. In only eukaryotes

C. Only in prokaryotes

D. Only in higher animals

Answer: A



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106. 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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107. What is the other name of glycolysis

- A. EMP pathway
- B. TCA pathway
- C. HMS pathway
- D. None of the above

Answer: A



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108. During respiration.....

A. 2 PGAL during glycolysis and none of the PGAL produced in Kreb's cycle.

B. 2 PGAL during glycolysis and 4 Pyruvic acid are produced in Kreb's cycle

C. 2 PGAL during glycolysis and 2 Pyruvic acid are produced in Kreb's cycle

D. PGAL is not produced during respiratory events.

Answer: A



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109. During respiration, pyruvic acid is formed by

Or

The first phase in the breakdown of glucose in animal cell
si

- A. Glycolysis
- B. Kreb's cycle
- C. HMP pathway
- D. None of the above

Answer: A

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

- A. Tricarboxylic acid cycle

B. Oxidative phosphorylation

C. Embden, Meyerhof, Parnas cycle (Glycolysis)

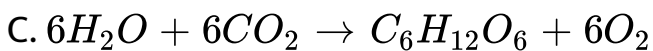
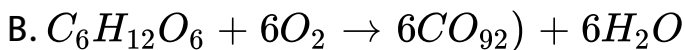
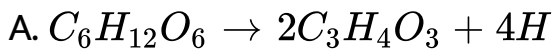
D. Krebs's cycle

Answer: C



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111. The formula for the process of glycolysis is



D. None of these

Answer: A



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112. Which group of the following scientists discovered the EMP pathway of glycolysis

- A. Embden, Meyerhof and Parnas
- B. Emerson, Hoffman and Peterson
- C. Embden, Morrison and Pitcher
- D. Avery, McLeaod and McCarthy

Answer: A



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113. Which one of the following products is formed in glycolysis of glucose

A. Pyruvic acid

B. Carbon dioxide

C. Citric acid

D. Ethanol

Answer: A



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114. Column I contains some enzymes and Column II contains reactions, Match them properly and choose the

right answer

	Column I		Column II
A.	Hexokinase	1.	Conversion of fructose-6-phosphate to fructose-1,6-diphosphate
B.	Triose Phosphate dehydrogenase	2.	Conversion of glucose to glucose-6-phosphate
C.	Phosphoglyceromutase	3.	Conversion of 1, 3-diphosphoglyceraldehyde to 1, 3-diphosphoglyceric acid
D.	Phosphofructokinase	4.	Conversion of 3-phosphoglyceric acid to 2-phosphoglyceric acid

A. A-1, B-2, C-3, D-4

B. A-2,B-3,C-4,D-1

C. A-2,B-1,C-3,D-4

D. A-1,B-5,C-2,D-4

Answer: B



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115. ATP formation in glycolysis is

- A. oxidation phosphorylation
- B. Photophosphorylation
- C. Reductive phosphorylation
- D. Substrate level phosphorylation

Answer: s



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

I		II	
1.	Fructose 1,6 diphosphate → 3 PGAL + DHAP	A.	Enolase
2.	Citrate → Cis - aconitate	B.	Thiokinase
3.	Succinyl Co. A → Succinate	C.	Aconitase
4.	2 PGA → 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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117. In muscles from three molecules of glucose, two are completely oxidized and one is incompletely oxidized (anaerobic) then, what will be the number of total NAD^{+0} molecules utilized

A. 10

B. 20

C. 14

D. 8

Answer: B



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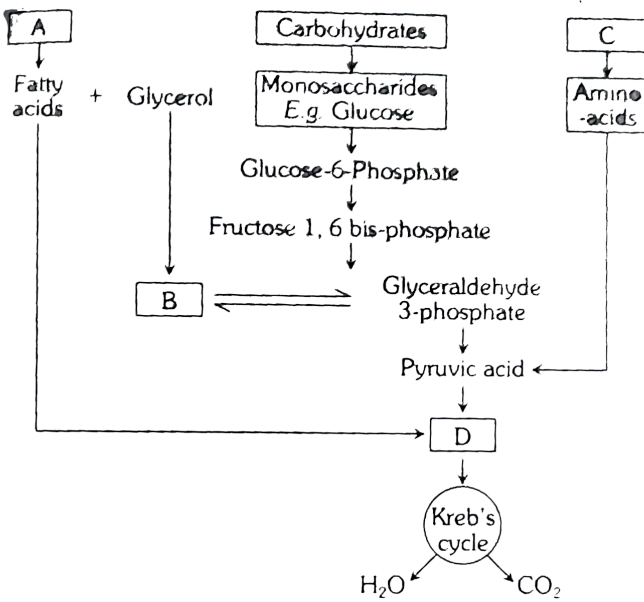
118. Which of the following process occur in glycolysis

- A. Oxidation
- B. Reduction
- C. Hydrogenation
- D. Fixation

Answer: A

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119. The given figure indicates the interrelationship among metabolic pathways. Identify A to D



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120. Glucose is

A. Pyranose pentose sugar

B. Furanose pentose sugar

C. Ketose hexose sugar

D. Aldose hexose sugar

Answer: D



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121. 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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122. Which of these statements is incorrect.

- A. Enzymes of TCA cycle are present in mitochondrial matrix
- B. Glycolysis occurs in cytosol
- C. Glycolysis operates as long as it is supplied with NAD that can pick up hydrogen atoms
- D. Oxidative phosphorylation takes place in outer mitochondrial membrane

Answer: D



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123. The details of tricarboxylic acid path was worked out by

- A. Meischer
- B. Hans Krebs
- C. Pasteur
- D. None of these

Answer: B



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124. The product formed by malic dehydrogenase is

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

Answer: C



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125. During Kreb's cycle energy from glucose is mostly transferred to

- A. NADH & FADH

B. NADPH

C. ADP

D. Water and CO_2

Answer: A



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126. The number of carbon atom in citric acid is

A. 8

B. 6

C. 10

D. 2

Answer: B



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127. Hydrogen of malate is accepted by

- A. FAD
- B. FMN
- C. COQ
- D. NAD

Answer: D



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128. During aerobic respiration maximum ATP is synthesized by

- A. ETS
- B. Kreb's cycle
- C. Glycolysis
- D. Fermentation

Answer: A

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

- A. NADH dehydrogenas
- B. Cytochromic c oxidas
- C. Ubiquinone
- D. Succinate dehydrogenase

Answer:



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130. Which intermediate compound is involved in the synthesis of amino acids

- A. Malic acid
- B. Citric acid

C. α -ketoglutaric acid

D. Isocitric acid

Answer: C

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131. During one Krebs cycle number of CO_2 molecules released is:

A. 1

B. 2

C. 3

D. 4

Answer: B

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132. During movement of electron through ETC

- A. pH of matrix increases
- B. Electrons are transported by active transport
- C. Electrons are resonated
- D. Electrons show fluorescence

Answer: A

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133. In citric acid cycle decarboxylation occurs when

- A. Citric acid converts to α -ketoglutaric acid
- B. Succinic acid converts to malic acid
- C. Malic acid converts to oxaloacetic acid
- D. Oxaloacetic acid converts to citric acid

Answer: A



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134. 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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135. 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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136. Krebs's cycle was discovered by Krebs in pigeon muscles in 1940. Which step is called gateway step. Link reaction/transition reaction in respiration.

A. Glycolysis

B. Formation of acetyl-coA

C. Citric acid formation

D. ETS terminal oxidation.

Answer: B

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137. In Kreb's cycle formation of

A. 34 ATP takes place

B. 38 ATP takes place

C. 15 ATP from each acetyl Co-A takes place

D. 12 ATP from each acetyl CO-A takes place (24 ATP)

Answer: D

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138. 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 dehydrogenase
- B. Isocitrate dehydrogenase
- C. Malate dehydrogenase
- D. Succinate dehydrogenase

Answer: D



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139. Cytochrome oxidase is a/an

- A. Exoenzyme
- B. Endoenzyme
- C. Proenzyme
- D. Coenzyme

Answer: B



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140. Synthesis of ATP in mitochondria require

- A. Oxygen
- B. NADP

C. FMN

D. Pyruvic acid

Answer: A



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141. Which of these steps in Kreb's cycle indicates substrate level phosphorylation

A. Conversion of succinic acid to α - ketoglutaric acid

B. conversion of succinic acid to malic acid

C. Conversion of succinyl Co. A to succinic acid

D. Conversion of malic acid to oxalo acetic acid

Answer: C

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142. Most of the energy in the cell is liberated by oxidation of carbohydrate when

- A. Pyruvic acid is converted into CO_2 and H_2O
- B. Pyruvic acid is converted into Acetyl CoA
- C. Sugar is converted into pyruvic acid
- D. Glucose is converted in alcohol and CO_2

Answer: A

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143. Complete oxidation of 1gm molecule of glucose gives rises to

A. 68,60,000 cal

B. 6,86,000 cal

C. 68,600 cal

D. 6,800 cal

Answer: B



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144. Pyruvic acid is converted into a compound before formation of oxaloacetic acid in the citric acid cycle, this

compound is

Or

Which of the following metabolites enter the TCA cycle during glucose oxidation.

- A. Acetyl CoA
- B. Acetoacetic acid
- C. Lactic acid
- D. cis aconitic acid

Answer: A

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145. In respiration, pyruvic acid is

- A. formed only when oxygen is available
- B. One of the product of Kreb's cycle
- C. broken down into two carbon fragments and CO_2
- D. A result of protein breakdown

Answer: C



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146. Match the number of carbon atoms given in List - I with that of the compounds given in list - II and select the

correct option.

	List - I		List - II
A.	4C Compound	1.	Acetyl CoA
B.	2C Compound	2.	Pyruvate
C.	5C Compound	3.	Citric acid
D.	3C Compound	4.	α - keto glutaric 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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147. 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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148. The reaction of Krebs's Cycle (TCA cycle) take place

Or

Pyruvate dehydrogenase complex, needed for the conversion of pyruvic acid to acetyl CoA is located in

.....

- A. In cytoplasm
- B. In endoplasmic reticulum
- C. In matrix of mitochondria
- D. On the surface of mitochondrion

Answer: C



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149. Which one is not correct about Krebs's cycle

- A. It is also called citric acid cycle
- B. The intermediate compound which links glycolysis with Krebs's cycle is malic acid

C. It occurs in mitochondria

D. It starts with six carbon compound

Answer: B



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

Or

Largest amount of phosphate bond energy is produced in the process of respiration during

A. Conversion pyruvic acid to acetyl CoA

B. Electron transport chain

C. Glycolysis

D. Krebs's cycle

Answer: D



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151. Choose the correct statement

A. Oxygen is vital in respiration for removal of

Hydrogen

B. Pyruvate is formed in the mitochondrial matrix

C. There is complete breakdown of glucose in fermentation

D. During the conversion of Succinyl CoA to Succinic acid a molecule of ATP is synthesized

Answer: A::D

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152. In Krebs's cycle the hydrogen atoms removed at succinate level are accepted by

A. FAD

B. ADP

C. ATP

D. NAD

Answer: A



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153. Oxidation phosphorylation occurs in

A. Outer membrane of mitochondria

B. Inner membrane of mitochondria

C. Stroma of chloroplast

D. Grana of chloroplast

Answer: B



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154. The enzymes for electron transport system are located in the

Or

Cellular energy is provided through respiration and oxidation by

- A. Plastid
- B. Endoplasmic reticulum
- C. Ribosomes
- D. Mitochondria

Answer: D



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155. Respiratory enzymes are located in

- A. Mitochondrial matrix (mitochondria)
- B. Perimitochondrial space
- C. Cristae
- D. Outer membrane

Answer: A

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156. Food is converted to energy in

A. Chloroplast

B. Nucleus

C. Mitochondria

D. None of the above.

Answer: C



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157. ATP molecules produced respectively by $\text{NADH}(H^+)$ and FADH_2 during electron transport are

A. 3 and 2

B. 1 and 1

C. 2 and 3

D. 3 and 3

Answer: A

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158. Which of the following is correct sequences in Kreb's cycle

A. isocitric acid \rightarrow oxalosuccinic acid \rightarrow α -ketoglutaric acid`

B. Oxalosuccinic acid \rightarrow Isocitric acid α -ketoglutaric acid

C. α -ketoglutaric acid \rightarrow Isocitric acid \rightarrow

Oxalosuccinic acid

D. Isocitric acid \rightarrow α -ketoglutaric acid \rightarrow

Oxalosuccinic acid

Answer: C

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159. In how many steps, CO_2 is released in aerobic respiration of pyruvic acid

A. One

B. Six

C. Three

D. Twelve

Answer: B



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160. Activity of succinic dehydrogenase involves the following in TCA cycle.

A. NAD

B. FAD

C. GDP

D. ATP

Answer: D



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161. The formation of acetyl coenzyme-A from pyruvic acid is the result of its

- A. Reduction
- B. Dehydration
- C. Dephosphorylation
- D. Oxidative decarboxylation

Answer: B



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162. Oxidation of succinate to fumerate in the Kreb's cycle is due to

- A. Loss of electron from it
- B. Removal of hydrogen from it
- C. Addition of oxygen to it
- D. None of the above

Answer: A



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163. Oxidative phosphorylation and photophosphorylation both require the electron carrier

A. Cytochrome

B. Oxygen

C. Carbon dioxide

D. Water

Answer: C



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164. Cytochrome helps in

A. Oxidation of glucose

B. Release of energy

C. Electron transport

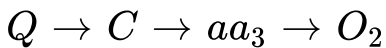
D. Growth

Answer: C



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165. In oxidative phosphorylation, the last 3 steps are as follows



A. $Q \rightarrow C$ is H^+ absorbing site

B. $aa_3 \rightarrow O_2$ is H^+ yielding site

C. $Q \rightarrow C$ is H^+ yielding site and $aa_3 \rightarrow O_2$ is H^+ absorbing site

D. No H^+ is absorbed or released

Answer: C



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

- A. Tricarboxylic acid cycle and urea cycle
- B. Krebs's cycle and Calvin cycle
- C. Tricarboxylic acid cycle and citric acid cycle
- D. Citric acid cycle and Calvin cycle

Answer: C



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167. By the reaction of α -ketoglutaric acid with ammonia, through which of the process glutamic acid is formed

- A. Oxidative amination
- B. Reductive amination
- C. Ammonification
- D. Transamination

Answer: B



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168. Biological oxidation in Krebs's cycle involves

- A. N_2

B. CO_2

C. O_2

D. SO_2

Answer: C



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169. Oxidative phosphorylation is the formation of

A. $NADPH_2$ in respiration

B. ATP in respiration

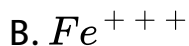
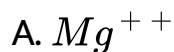
C. $NADPH_2$ in photosynthesis

D. ATP in photosynthesis

Answer: B

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170. Mineral activator needed for the enzymes carboxylase of TCA cycle is



Answer: A

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171. Kreb's cycle involves the formation of

- A. Lactic acid from glucose
- B. Change of pyruvic acid to energy transformation
- C. Pyruvic acid from glucose
- D. ATP from ADP

Answer: B



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172. In the electron transport system, the reduced coenzymes are regenerated by

- A. Loss of hydrogen

- B. Loss of electron
- C. Additin of oxygen
- D. None of the above

Answer: B



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173. Which of the following does not function as an electron carrier

- A. Coenzyme Q
- B. Cytochrome-C
- C. Cytochrome-a

D. cytochrome- a_3

Answer:

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174. Kreb's cycle begins with

- A. Pyruvic acid
- B. Hydrochloric acid
- C. Corticosteroids
- D. Lysine

Answer: A

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175. In ETS, electron combines to

A. Cytochrome

B. H_2

C. O_2

D. H_2O

Answer: B



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176. 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. Fifty-seven

B. One

C. Two

D. Thirty

Answer: A

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177. Each molecule of pyruvic acid entering the Krebs cycle produces

A. 2 molecules of CO_2

B. 3 molecules of CO_2

C. 1 molecule of CO_2

D. 5 molecules of CO_2

Answer: B



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178. 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. Cyt b

B. Cyt a_3

C. Cyt a

D. Cyt c

Answer: B



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179. Upon the oxidation of one mole of pyruvate by mitochondrial respiration, the moles of ATP generated by mitochondrial respiration, the moles of ATP generated are

A. 38

B. 30

C. 8

D. 15

Answer: D

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180. Kreb's cycle is also called

- A. TCA cycle
- B. Citric acid cycle
- C. Tricarboxylic cycle
- D. All the above

Answer: D

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181. Krebs's cycle is found in

- A. Anaerobic respiration
- B. Photorespiration
- C. Photosynthesis
- D. Aerobhic respiration

Answer: D



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182. The importance of Krebs's cycle is in the production of

- A. Acetyl CoA

B. Water

C. ATP

D. ADP

Answer: C



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183. The correct sequences of electron acceptor in ATP synthesis is

A. Cyt a a b c

B. Cyt b c a a_3

C. Cyt b c a_3 a

D. Cyt c b a a_3

Answer: B

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

- A. Succinyl CoA to succine acid
- B. α -ketoglutarate to succinyl CoA
- C. Fumaric acid to malic acid
- D. Succinic acid to fumaric acid

Answer: D



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185. Which transfer electrons in E.T.S)(Electron transport system)

A. Phytochrome

B.

C. F_1 particles

D. Fe-S

Answer: C



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186. The pyruvic acid formed in Glycolysis is oxidised to CO_2 and H_2O in a cycle called

- A. Calvin cycle
- B. Hill reaction
- C. Krebs's cycle
- D. Nitrogen cycle

Answer: C

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187. Which one of the following energy storing compound is formed when succinyl CoA is converted into succinic acid

A. ADP

B. ATP

C. AMP

D. GTP

Answer: D



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188. Which of the following is not an electron transferring molecule

A. ATP

B. NAD^+

C. Fe-S protien

D. Co-enzyme Q

Answer: A



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189. Cytochromes are

A. Lipid

B. Glycoprotein

C. Metalloporphyrins

D. Fe^{++} containing with porphyrin pigment

Answer: D



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190. Cytochromes occur in

- A. Cristae of mitochondria
- B. Matrix of mitochondria
- C. Outer mitochondrial membrane
- D. Entire inner mitochondrial membrane

Answer: A



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191. Last e^- acceptor during *ETS* is

A. H_2O

B. O_2 combines with carbon to form CO_2

C. Cyt a_3

D. Cyt a

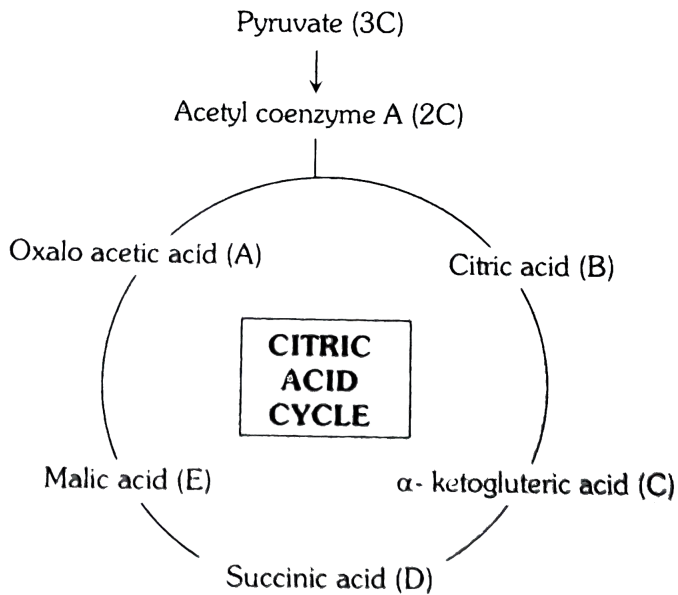
Answer: B



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192. Choose the correct combination of labelling the number of carbon compounds in the substrate molecules,

involved in the citric acid cycle



- A. A-4C, B-6C, C-5C, D-4C, E-4C
- B. A-6C, B-5C, C-4C, D-3C, E-2C
- C. A-2c, B-5C, C-6C, D-4C, E-4C
- D. A-4C, B-6C, C-4C, D-4C, E-4C

Answer: A



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193. Oxidative phosphorylation is

- A. Formation during substance oxidation
- B. Formation of ATP by transfer of phosphate group from a substrate to ADP
- C. Oxidation of phosphate group in ATP
- D. Addition of phosphate group to ATP

Answer: A



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194. Which statement is wrong for Krebs' 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 (Acetyl CoA) with pyruvic acid to yield citric acid

Answer: D



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195. The reactions of pentose phosphate pathway (PPP) take place in

A. Mitochondrion

B. Cytoplasm

C. Chloroplast, peroxisome and mitochondrion

D. Chloroplast, lysosome and mitochondrion

Answer: B



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196. Which of the following is a direct oxidation pathway being performed without glycolysis

- A. TCA cycle
- B. HMP pathway
- C. Both a and b
- D. None of these

Answer: B

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197. In which of the following process 36 ATP molecules are produced by per hexose molecule

- A. Glycolysis
- B. Kreb's cycle

C. Direct oxidation pathway

D. None of the above

Answer: C



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198. 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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199. Shikimic acid can be made from

- A. Xylulose
- B. Erythrose-4-phosphate
- C. Ribulose
- D. None of the above

Answer: B



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200. HMP shunt is an alternative to

- A. Krebs's cycle
- B. Aerobic glycolysis
- C. Calvin cycle
- D. C_4 pathway

Answer: B

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201. 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 kJ

A. A,B and D only

B. C and D only

C. A and D only

D. A,C and D only

Answer: C



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202. HMP shunt is a set of reactions.



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203. Pentose phosphate pathway, an alternative pathway of respiration was elucidated by

- A. Horecker
- B. Warburg and Dickens
- C. Blackman
- D. Kelvin

Answer: B



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204. In Hexose monophosphate shunt, the number of CO_2 molecules evolved is

- A. same as in glycolysis
- B. less than glycolysis
- C. More than glycolysis
- D. much lesser than glycolysis

Answer: C

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205. 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: B



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

A. 1

B. 0.5

C. 2

D. 0.005

Answer: A



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207. If R. Q. is less than 1.0 in a respiratory metabolism it would mean that

- A. Carbohydrates are used as respiratory substrate
- B. Organic acids are used as respiratory substrate
- C. The oxidation of the respiratory substrate consumed more oxygen than the amount of CO_2 released
- D. The oxidation of the respiratory substrate consumed less oxygen than the amount of CO_2 released

Answer: C



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208. Which of the following respiratory material may show the unit value of R.Q.

A. Stem of wheat

B. Leaf of barley

C. Leaf of oat

D. all the above.

Answer: D



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209. Which of the following respiratory substances requires the highest number of O_2 molecules for its complete oxidation.

A. Tripalmitin

B. Triolein

C. Tartaric acid

D. Oleic acid

Answer: B



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210. Substance whose RQ is less than one is

A. Carbohydrate

B. Protein

C. Organic acid

D. All the above

Answer: B



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

A. Pure protein

B. Lipid

C. carbohydrates

D. A and B both

Answer: D



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212. Which is the value of RQ of castor seeds, if the imaginary values of Ganong's respirometer are as follows

i) First rise of saline = 10ml

ii) Second rise of saline after adding KOH = 30ml

A. 0.33

B. 0.75

C. 0.85

D. 3

Answer: B



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213. The energy content in Kcal/g of carbohydrate : protein : triglycerol respectively is approximately in the ratio of

A. 1 : 2 : 2

B. 1 : 1 : 2

C. 2 : 1 : 1

D. 2 : 2 : 1

Answer: B



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214. The respiratory quotient during cellular respiration would depend on

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

Answer: D



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215. RQ in anaerobic respiration is

A. 0

B. ∞

C. 1

D. >1

Answer: B



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216. The R.Q. of a plant organ depends upon the nature of the substrate which is

A. Reduced

B. Oxidized

C. Catabolized

D. Metabolized

Answer: B



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217. R.Q. of fatty substances is generally

A. Unity

B. Less than one (Approx 0.7)

C. Greater than one

D. Metabolized

Answer: B

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218. Which of the following option is correct for the given statements , X, Y and Z
Statements X - R.Q. of fat containing palmatic acid is less than one, whereas R.Q. of glucose is 1
Statement Y - Fat containing palmatic acid need less O_2 for respiration and glucose need more oxygen for respiration
Statement Z - fat containing palmatic acid has much less oxygen in its constituion as compared to glucose.

A. Statement X, Y and Z are correct and statement Y and Z are correct explanation for X.

- B. Statement X and Y are correct and statement Z is incorrect statement Y is correct explanation for X
- C. Statement X and Z are correct and statement Y is incorrect statement Z is correct explanation for X
- D. Statement X and Z are incorrect and statement Y is correct.

Answer: C

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

A. One

B. Less than one

C. More than One

D. Zero

Answer: D



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220. In succelents respiratory quotient is always less than one because of

A. Complete oxidation

B. Complete oxidation

C. Incomplete oxidation

D. Incomplete oxidation.

Answer: C

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221. The R.Q. value of oxalic acid is

A. 1

B. 0.7

C. 4

D. infinity

Answer: C

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222. 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. One
- B. More than one
- C. Less than one
- D. Zero

Answer: C



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223. R.Q. of malic acid is

A. 0.7

B. 1

C. 1.33

D. 4

Answer: C



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224. The correct relationship of value of Respiratory Quotient is

A. Glucose symbol $>$ Fats symbol $>$ Organic acid

B. Glucose symbol It Fats symbol It Organic acid

C. Fats symbol gt Glucose symbol It Organic acid

D. Fats symbol It Glucose symbol It Organic acid

Answer: D



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

A. Fat

B. Fructose 1, 6 diphosphate

C. Glucose-6-phosphate

D. Organic acid

Answer: D

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226. R.Q. of sprouting potato tubers will be

A. 1

B. 1t1

C. gt1

D. 0

Answer: A

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227. Respiratory quotient may be represented as

- A. Volume of CO_2 evolved = volume of O_2 consumed
- B. (Volume of O_2 consumed)/(Volume of CO_2 evolved)
- C. (Volume of CO_2 evolved)/(Volume of O_2 consumed)
- D. (Volume of O_2 evolved)/(Volume of CO_2 consumed)

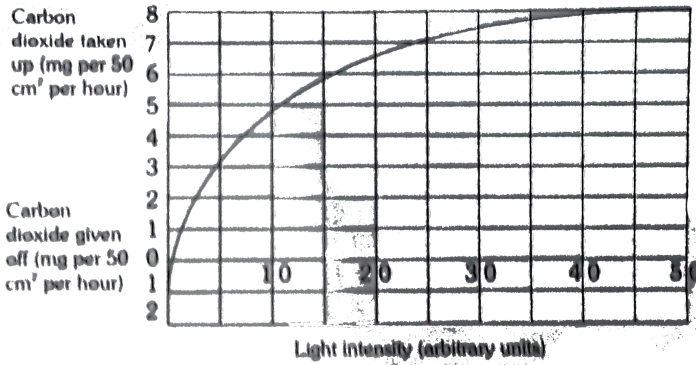
Answer: C



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228. The graph shows the relation between light intensity and the giving off and taking up of carbon dioxide by the leaves of a plant. Why is most carbon dioxide given off

when the light intensity is zero units.



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229. The potato growing in hilly areas in size due to

- A. High rate of photosynthesis at high altitude
- B. Low rate of respiration at high altitude Due to formation of more fat
- C. None of the above

D.

Answer: B

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230. When an unripe banana is sealed in a polythene bag, it remains green for many days. But if an apple is also sealed in the same bag. The banana ripens and turns yellow within a few days. The reason is that apple

- A. Removes O_2 released by the banana and thus promotes ripening
- B. Produces CO_2 which promotes ripening
- C. Removes CO_2 which inhibits ripening

D. Releases ethylene which promotes ripening

Answer: D

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231. If the temperature is increased (above $35^{\circ}C$)

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

Answer: B



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232. CO_2 concentration has which relation with respiration

- A. Directly proportional
- B. Inversely
- C. Both (a) and (b)
- D. No relation

Answer: B



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233. Which statements is wrong

A. Stomatal opening is influenced by many factors and potassium

B. All enzymes are proteins but all proteins are not enzymes

C. All angiosperms are with seeds but all seed plants are not angiosperms

D. Factors which effect the respiration influence the photosynthesis but reverse is not possible

Answer: D



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234. Which of the following is necessary for respiration influence in plants

A. Carbon dioxide

B. Oxygen

C. Chlorophyll

D. Light

Answer: B



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235. The rate of respiration of young maturing seeds is quite high but as water contents decreases during further

maturation,

- A. Remains high
- B. Stops completely
- C. Increases steadily
- D. Decreases steadily

Answer: D



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236. In presence of cyanide, azide and carbon monoxide, the rate of respiration.

- A. Decreases

B. Increases

C. Remains the same

D. None of the above

Answer: A



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237. The ultimate electron acceptor of respiration in an aerobic organism is

A. Ctochrome

B. Oxygen

C. Hydrogen

D. Glucose

Answer: B



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238. Phosphorylation of glucose during glycolysis is catalysed by

- A. Phosphoglucosmutase
- B. Phosphoglucoisomerase
- C. Hexokinase
- D. Phosphorylase

Answer: C

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239. Pyruvic acid, the key product of glycolysis can have many metabolic fates. Under aerobic condition it forms

- A. Lactic acid
- B. $CO_2 + H_2O$
- C. Acetyl $COA + CO_2$
- D. Ethanol + CO_2

Answer: C

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240. Electron Transport system (ETS) is located in mitochondrial

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

Answer: B



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241. Match the following columns

Column A

- A. Molecular oxygen
- B. Electron acceptor
- C. Pyruvate dehydrogenase
- D. Decarboxylation

Column B

- i. α - Ketoglutaric acid
- ii. hydrogen acceptor
- iii. Cytochrome C
- iv. acetyl Co A

A. A-ii, B-iii, C-iv, D-i

B. A-iii, B-iv, C-ii, D-i

C. A-ii, B-i, C-ii, D-iv

D. A-iv, B-iii, C-i, D-ii

Answer: A



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242. Choose the correct statement

- A. Pyruvate is formed in the mitochondrial matrix
- B. During the conversion of succinyl Co-A to succinic acid a molecule of ATP is synthesized
- C. Oxygen is vital in respiration for removal of hydrogen
- D. These is complete breakdown of glucose in fermentation

Answer: C

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243. Mitochondria are called power houses of the cell.

Which of the following observations support this statement?

A. Mitochondria synthesise ATP

B. Mitochondria have a double membrane

C. The enzymes of the Krebs cycle and the cytochromes are found in mitochondria

D. Mitochondria are found in almost all plants and animal cells.

Answer: A



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244. The end product of oxidative phosphorylation is

A. NADH

B. Oxygen

C. ADP

D. ATP + H_2O

Answer: D

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245. 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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246. how many molecules of ATP and NADPH are require in formation of two molecules of glucose ? How many calvin cycles are required

- A. 36 ATP ,24 NADPH,12 Calvin cycles
- B. 18 ATP , 12 NADPH ,6 Calvin cycles
- C. 36 ATP , 24 NADPH,6 Calvin cycles
- D. 24 ATP , 36 NADPH

Answer: A

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247. for 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) fumarase (iv) Alcohol dehydrogenase

A. II,IV,III,I

B. IV, I,II,III

C. I, IV, III,I

D. IV,I ,III , II

Answer: D



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248. match the compounds given I column I with the number of carbon atoms present in them which are listed under column II. Choose the answer which given the correct combination of alphabets of the two columns

Column-I		Column-II	
(A)	Oxaloacetate	(p)	6-C compound
(B)	Phosphoglycrealdehyde	(q)	5-C compound
(C)	Isocitrate	(r)	4-C compound
(D)	α -ketoglutarate	(s)	3-C compound
		(t)	2-C compound

A. s,t,q,r

B. r,s,p,q

C. R,T,P,q,

D. q,s,p,t

Answer: D



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249. in respiration the energy is produced during the process of

- A. glycolysis
- B. krebs cycle
- C. glycolysis and kreb's cycle
- D. Ornithine cycle

Answer: C



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250. Hibernating animals have tissue containing mitochondria with a membrane protein that accelerates transport while blocking the synthesis of ATP, what is the consequence of this

- A. Hibernating animals can synthesize fat instead of wasting energy of respiration
- B. Energy is saved because glycolysis and the citric acid cycle shuts down
- C. pyruvate is converted to lactic acid by anaerobic
- D. the energy of respiration is converted into heat

Answer: D



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251. production of glucose from amino acids , fatty acids and glycerol is called

or

synthesis of glucose from sources other synthesis of glucose from sources other than carbohydrate is called

- A. Glycogenesis
- B. Gluconeogenesis
- C. glycogenolysis
- D. glycolysis

Answer: B



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252. net yield of aerobic respiration during krabs cycle per glucose molecule is

- A. 2ATP molecules
- B. 8 ATP molecules
- C. 36 ATP molecules
- D. 38 ATP molecules

Answer: A



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253. which of the following is non - enzymatic phosyhorylation

- A. formation of fructose 1-6 diphosphate
- B. formation of dihydroxyacetone phosphate
- C. formation of 1, 3 - diphosphoglyceraldehyde
- D. all the above

Answer: C

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254. in alcohol fermentation

- A. oxygen is the electron acceptor
- B. triose phosphate is the electron donor while acetaldehyde is the electron acceptor

- C. triose phosphate is the electron donor while pyruvic acid is the electron acceptor
- D. there is no electron donor

Answer: D



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255. the number of glucose molecules required to produces 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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256. hardan and young 's ester is fromed during glycolysis
from

- A. fructose - 6- phosphate
- B. glucose - 6 - phosephate
- C. glucose
- D. none of the above

Answer: A



257. select the wrong statmeny

A. when tripalmith is used as a substrate in respiration ,

the R. Q . Is 0.7

B. the intermediate compound which links glycolysis

with kreb's cycle is malic acid

C. one glucose molecule yields a net gain of 36 ATP

molecules during fermentation

D. the schheme of glycolysis was given by Enbden ,

meyerhof and parnas

Answer: B



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258. which among the following is the most appropriate reason for storing green coloured apples at low temperature

A. the rate of photosynthesis is reduced

B. respiration and photosynthesis are completely inhibited

C. the rate of respiration is reduced

D. the rate of photosynthesis and respiration are reduced

Answer: C



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

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

B. 132 gms of CO_2 , 534 gms of water and 337 kcalas of energy

C. 264 gms of CO_2 ,180 gms fo water and 674 kcalas of energy

D. 528 gms of CO_2 , 216 gms of water and 1348 kcalas of energy

Answer: C



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260. When ATP molecules is hydrolysed in AdP, then the quantity of energy released is about

- A. 120 cal
- B. 1,200 cal
- C. 12,000 cal
- D. 1,20,000 cal

Answer: C



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261. The R.Q. (Respiratory quotient) of $C_{39}(H_{72}O_6)$ is

A. 2.71

B. 1.34

C. 0.72

D. 3.25

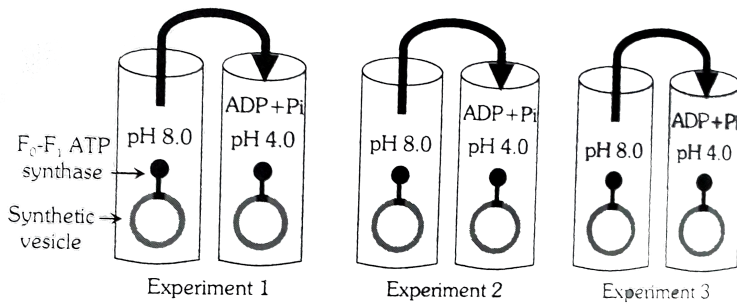
Answer: C



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262. Experiments 1, 2 and 3 were conducted wherein synthetic vesicles containing F_0-F_1 ATP synthase were prepared and incubated overnight in a tube. Subsequently

the vesicles were transferred to another tube which also contained ADP and Pi (inorganic phosphate)



A) A proton gradient across the vesicular membrane will be present in both experiments 1 and 2 at the time of transfer

B) As a consequences of the proton gradient, ATP will be synthesized in both experiments 1 and 2

C) ATP will be synthesized in experiment 3 because $F_0 - F_1$ ATP synthesis has the inhernt property to catalyse the synthesis of ATP from ADP and Pi

D) ATP will be synthesized in experiment 2 because the

proton has to flow out of the vesicles through the $F_0 - F_1$

ATP synthase for ATP synthesis

A. A and D

B. C and D

C. B and C

D. A and B

Answer: A

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263. The time taken from the fixation of CO_2 to the formation of one glucose molecules is about.....

Seconds

A. 20

B. 40

C. 60

D. 90

Answer: D



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264. In an experiment demonstrating the evolution of oxygen in Hydrilla, sodium bicarbonate is added to water in the experimental set-up. What would happen if all other conditions are favourable.

- A. Amount of oxygen evolved decreases as carbon dioxide in water is absorbed by sodium bicarbonate
- B. Amount of oxygen evolved increases as the availability of carbon dioxide increases
- C. Amount of oxygen evolved decreases as the availability of carbon dioxide increases.
- D. Amount of oxygen evolved increases as carbon dioxide in water is absorbed by sodium bicarbonate

Answer: B



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

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

Answer: B

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266. Assertion : In alcoholic fermentation, the hexose molecule is converted into glucose and fructose.

Reason : Alcoholic fermentation is anaerobic respiration brought about by enzyme zymase.



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267. Assertion: Glycolysis occurs in cytoplasm.

Reason: Enzymes for glycolysis are found in cytoplasm. It is common in aerobic/anaerobic respiration.



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268. Assertion: In electron transport chain, there is a gain of energy at each step.

Reason : At each step of EtC, there are electron carriers.



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269. Assertion: The inner membrane of mitochondria contains systems involving electron transport.

Reason: The mitochondrial matrix contains enzymes of Krebs's cycle.

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270. Assertion: Both hexokinase and glucokinase require divalent cation Mg^{++} or Mn^{++}

Reason: The divalent cations act as catalysts.

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271. Assertion: One way of indicating the ATP yield from oxidative phosphorylation is the P/O ratio.

Reason: The cell stores 40% of the chemical energy.

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272. Assertion: Cytochromes are a group of copper containing electron transferring proteins.

Reason: The terminal cytochrome reacts with oxygen.

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273. Assertion: Cytochrome oxidase enzyme contains copper.

Cyanide combines with copper of cytochrome oxidase and prevents oxygen combining with it

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274. Assertion: Substrate level phosphorylation is present in glycolysis.

Reason: Substrate level phosphorylation causes synthesis of ATP.

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275. Assertion: Under aerobic conditions, pyruvate gives rise to lactate.

Reason: Under anaerobic condition, pyruvate gives rise to acetyl CoA.

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276. Assertion: Terminal oxidation occurs both in aerobic and anaerobic conditions.

Reason: Terminal oxidation occurs at terminal step of respiration.

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277. Assertion : During the hydrolysis of typical chemical bonds, about 3000 calories per mole are liberated.

Reason: ATP also yields about 3000 calories per mole after the release of any one of the two terminal phosphate.

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278. Assertion: Fructose-1, 6 diphosphate is converted into glyceraldehyde-3-phosphate and dihydroxy -acetone -3-phosphate.

Reason: Conversion of fructose-1,6 diphosphate into 3-phosphoglyceraldehyde and dihydroxyace -tone -3-phosphate is facilitated by the enzyme aldolase.

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279. Enzymes found attached to inner membrane of mitochondria instead of matrix is/are

- A. Cytochrome oxidase
- B. Succinic dehydrogenase
- C. Both a and b
- D. Malate dehydrogenase

Answer: C



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280. Anerobic respiration is also known as

- A. Intra molecular respiration

B. Extramolecular respiration

C. Molecular respiration

D.

Answer: A



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281. The process by which ATP is produced in the inner membrane of a mitochondrion. The electron transport system transfers protons from the inner compartment of the outer, as the protons flow back to the inner compartment, the energy of their movement is used to add phosphate to ADP, forming ATP

A. Phosphorylation

B. Glycolysis

C. Fermentation

D.

Answer: A



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282. Which of the following process makes direct use of oxygen ?

A. Fermentation

B. Electron transport

C. Kreb's citric acid cycle

D.

Answer: C



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283. What is active glucose

A. NAD-glucose

B. Phosphoglucose

C. Glycerophosphate

D.

Answer: C



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284. High fatty acids are breaking by

- A. α -oxidation
- B. Glycolysis
- C. Beta - Oxidation
- D. All of these

Answer: A



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

A. 5 ATP

B. 8 ATP

C. 38 ATP

D.

Answer: A



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286. Fruit keep better in refrigeration, this is due to

A. Absence of moisture

B. Accumulation of O_2

C. Inactivation of respiration

D. Respiratory rate is low in refrigeration.

Answer: D



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287. Vant Hoff's law states that

A. The respiration rate decrease two or three times for every rise of 110°C

B. The respiratino rate does not increase or decrease with change in temperature

C. The respiration rate increase two or three times for every rise of 10°C .

D.

Answer: D



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

A. Anthesis

B. Climatic

C. Photorespiration

D. Climateric

Answer: A

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

A. Malic acid

B. Glucose

C. Protein

D.

Answer: B

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290. An indispensable role in energy metabolism is played by

- A. Phosphorus
- B. Calcium
- C. Potassium
- D.

Answer: B

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291. Fermentation is by

A. All bacteria

B. Some fungi and some bacteria

C. All micro-organisms

D.

Answer: C



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