



BIOLOGY

BOOKS - NIKITA PUBLICATION

Respiration and Energy Transfer

Exercise

1. The term respiration was coined by

A. Calvin

B. Dutton

C. Sack

D. Hans Krebs

Answer:



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2. Respiration is a process

A. intracellular

B. catabolic

C. exothermic process

D. All of these

Answer:



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3. Respiration is

A. exergonic

B. heat releasing process

C. energy releasing

D. all of these

Answer:



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4. Repiration is carried out by

A. all plant cells only

B. all animal cells only

C. all baterial cells only

D. all living cells

Answer:



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5. The importance of respiration in plants & animals is

A. Maintain balance of CO_2 and O_2

B. Release energy

C. Both a and b

D. trap energy

Answer:



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6. Respiration in higher organisms is

A. catabolic process CO_2 used O_2 released

B. anabolic process CO_2 used and O_2
released

C. anabolic process in which O_2 used CO_2
released and ATP are formed

D. cataboic process O_2 used, CO_2 released

ATP are formed

Answer:



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7. Storage of carbohydrate in mammalian muscles taken place in which form

A. Glucose

B. Lactic acid

C. Glycogen

D. Pyruvic acid

Answer:



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8. Which of the following is the source of respiration

A. Stored food

B. RNA

C. DNA

D. ATP

Answer:



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9. Identify the true statement from the following

A. anaerobic respiration occurs in some bacteria, fungi

B. aerobic respiration occurs during night
time only

C. aerobic respiration doesn't occur in all
living cells

D. both a and c

Answer:



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10. Read the following statements and find out the incorrect statement. A. Ultimately all the food that is respired for life processes comes from photosynthesis. B. The energy released by oxidation in respiration is directly used for the life processes. C The carbon skeleton produced during respiration is used as precursors for biosynthesis of other molecules in cell. D. Plants, unlike animals, have no specialised organs for gaseous exchange but they have stomata and lenticels for this purpose. E. During oxidation within a cell, all

the energy contained in, respiratory substrates is released free into the cell in a single step, which is trapped as chemical energy in the form of ATP.

A. b and e

B. a and b

C. c and e

D. b and d

Answer:



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11. Which of the following is common respiratory substrate/ main fuel for respiration

- A. carbohydrates
- B. proteins
- C. fats, organic acids
- D. All of these

Answer:



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12. Which of the following are used as respiratory substrate/ fuel for respiration which is stored as reserve food

A. carbohydrates

B. proteins

C. fats

D. All of these

Answer:



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13. Blackman termed respiration of carbohydrates, fats as

- A. aerobic respiration
- B. protoplasmic respiration
- C. floating respiration
- D. anaerobic respiration

Answer:



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14. When proteins are used as respiratory substrate it is called as

- A. aerobic respiration
- B. protoplasmic respiration
- C. floating respiration
- D. anaerobic respiration

Answer:



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15. When carbohydrate supply is exhausted...is used as respiratory substrate

A. organic acids

B. proteins

C. fats

D. vitamins

Answer:



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16. Energy produce per gram is highest for

A. Wheat starch

B. Rice starch

C. Potato starch

D. All equally

Answer:



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17. Different steps in respiration are controlled by

A. Auxin

B. Sugar

C. Enzyme

D. Kinetin

Answer:



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18. 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:



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19. Respiration differs from the process of combustion in the fact respiration shows

A. All the energy stored in glucose is released at once due to combustion

B. All energy stored in glucose is gradually released by enzymes

C. large amount of energy is released than combustion

D. The carbohydrates act as the combustion substance

Answer:



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20. Amino acids enter respiratory pathway

A. After deamination

B. As fumarate and oxaloacetate

C. Acetyl CoA, succinyl CoA and *Alpha* -
ketoglutarate

D. All the above

Answer:



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21. The sequence of respiratory substrates used during respiration are

A. Fats, carbohydrates, protein

B. Carbohydrates, fats, proteins, organic,
acids

C. Carbonhydrates, proteins, fats,

D. Protein fats, carbohydrates

Answer:



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22. Maximum number of ATP is synthesized during oxidation of

A. amino acid (Protein)

B. Malic acid

C. Glucose (carbohydrates)

D. Palmitic acid (fat)

Answer:



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23. Mark the wrong statement

A. fats and proteins not acts as raw material in animals.

B. respiration decrease dry weight

C. respiration is continuous process

D. respiration occurs in plantae, animalia, fungi

Answer:



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24. The exchange of gases between organism- and environment is called as

- A. cell respiration
- B. tissue respiration
- C. external respiration
- D. internal respiration

Answer:



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25. The exchange of gases between tissue and tissue fluid in animals and intercellular spaces in plants is called as

- A. cell respiration
- B. tissue respiration
- C. externa respiration
- D. internal respiration

Answer:



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26. The breakdown of complex organic compounds into simple form to release energy is called as

- A. cell respiration
- B. tissue respiration
- C. external respiration
- D. internal respiration

Answer:



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27. Cell organelles associated with the process of aerobic respiration are

A. Chloroplasts

B. Endoplasmic reticulum

C. Mitochondria

D. Peroxisomes

Answer:



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28. Mitochondria are present in

A. nucleus of eukaryotic cells

B. cytoplasm of eukaryotic cells except
mammalian RBC

C. cytoplasm of prokaryotic cells

D. cytoplasm of eukaryotic cells except WBC

Answer:



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29. In aerobic prokaryotes ETS occurs in

A. cytoplasm

B. polysomes

C. plasma membrane

D. ribosomes

Answer:



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30. The number of mitochondria depends upon

- A. size of cell
- B. length of cell
- C. organells in cell
- D. activity of cell

Answer:



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31. All of the cells having large number of mitochondria except

- A. cardiac muscle
- B. meristematic cells
- C. liver and nerve cells
- D. vascular tissue

Answer:



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32. The size of mitochondria is about

A. 3-4 micron in length and 0.5-1 micron
thick

B. 4-10 micron in length and 0.5-1 micron
thick

C. 3-4 micron in length and 5-10 micron
thick

D. 4-10 micron in length and 3-5 micron
thick

Answer:



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33. Mark the wrong statement

A. outer membrane is smooth, freely permeable to small molecules

B. porin protein forms channel to make membrane permeable

C. Outer membrane is continuous & inner membrane is folded

D. Outer membrane is folded & inner membrane is continuous

Answer:



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34. The folds of inner membrane of mitochondria towards inner side are called as

A. cytosol

B. peristromium

C. cristae

D. matrix

Answer:



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35. Which of the following is Not true about cristae

A. greatly increase inner surface of mitochondria

B. cristae are tubular in plants and plate like in animals

C. cristae incloses intracristal space which to outer chamber

D. cristae are the sites of Kreb's cycle

Answer:



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36. ETS and TCA enzymes occur in

A. Cytoplasm

B. Cytosol

C. Mitochondria

D. Cytoplasm and mitochondria

Answer:



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37. The side of the inner membrane of mitochondria facing the matrix is called and outer chamber is called as

A. C-side, M side

B. C side F-side

C. C side, S side

D. M-side, C side

Answer:



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38. The site of ATP generation in mitochondria is

- A. F1 particles
- B. base piece of oxysome
- C. matrix
- D. outer membrane

Answer:



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39. Elementary particles consist of

A. globular head of $75 - 100 \text{ \AA}$ site of ATP
generation

B. middle stalk of $45 - 50 \text{ \AA}$ has coupling
factors

C. base embedded in inner membrane acts
as proton tunnel

D. All of these

Answer:



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40. The matrix contains all enzymes of kreb's cycle except

A. keto-glutaric dehydrogenase

B. succinate dehydrogenase

C. Both a and b

D. pyruvate dehydrogenase

Answer:



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41. Matrix is site of

A. EMP pathway

B. oxidative decarboxylation of Pyruvate

C. Kreb's cycle

D. Both b and c

Answer:



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42. All of the following are present in matrix except

A. 70S ribosome

B. 2-6 circular DNA molecules

C. most of the enzymes of kreb's cycle

D. electron carries of ETS

Answer:



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43. Mitochondria is a semi-autonomous cell organelle as it contains

A. F 1 particles

B. ATP synthetase

C. DNA

D. enzymes for kreb's cycle

Answer:



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44. In aerobic respiration most of the steps takes place in

A. cytosol

B. mitochondria

C. plasma membrane

D. mesosome

Answer:



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45. Why mitochondria is called as power house of cell chamber

A. they help in complete oxidation

B. supply ATP when ever required

C. intermediate compounds are used in synthesis of chlorophyll, steroids

D. both a and b

Answer:



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46. In aerobic bacteria the role of mitochondria is played by

A. plasma mebrane

B. cell wall

C. slime layer

D. capsule

Answer:



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47. In aerobic bacteria the steps like glycolysis, acetylation, TCA cycle take place in... while ETS is located in

- A. plasma membrane, cytoplasm
- B. cell wall, cytoplasm
- C. slime layer, cytoplasm
- D. cytoplasm, mesosome

Answer:



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48. Glycolysis occurs in

A. only eukaryotic cells

B. all cells

C. prokaryotic cells

D. only muscle cells

Answer:



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49. The first step in aerobic respiration takes place in

- A. Mitochondrial matrix
- B. Perimitochondrial space
- C. Both in cytosol and mitochondria
- D. Cytoplasm

Answer:



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50. The first three steps of glycolysis are called as

- A. preparatory phases
- B. Shynthetic pahses
- C. dehydration phases
- D. dephosphorylation phases

Answer:



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51. Two names referring the same process are

- A. EMP and glycolysis
- B. TCA and urea cycle
- C. Citric acid cycle and Calvin cycle
- D. Kreb's cycle and HSK cycle

Answer:



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52. In glycolysis glucose splits into compounds which are

A. one 5-c compounds

B. two 3-compounds

C. one 3-compound

D. one 6-ccompounds

Answer:



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53. Glycolysis represents the common step of aerobic and anaerobic respiration. It does

- A. forms lactic acid
- B. involve oxidation, phosphorylation
- C. involve reduction
- D. forms alcohol

Answer:



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54. Universal pathway of respiration operate in

A. cytosol

B. mitochondrial matrix

C. oxysomes

D. inner membrane of mitochondria

Answer:



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55. Why glycolysis is called as EMP pathway

A. reactions occurs in cytoplasm

B. it is a first step

C. reactions are discovered by Embdon,

Meyerhof, Parnas of German scientists

D. reactions are discovered by Embdon,

Meyerhof, Parnas of American scientists

Answer:



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56. Why glycolysis is common pathway of aerobic & anaerobic respiration

- A. takes place in cytoplasm
- B. does not require mitochondria
- C. does not require free O_2
- D. All of these

Answer:



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57. The glycolysis is also called as

- A. cytoplasmic respiration
- B. Core respiration
- C. fundamental respiration
- D. All of these

Answer:



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58. The glycolysis is also called as oxidative anabolism or catabolic resynthesis because

A. they produce glucose

B. respiration is anabolic reaction

C. it links anabolism of fats and amino acids

D. oxidation of glucose in to 2C compounds

Answer:



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59. The main respiratory substrate in plants is

A. Glucose

B. Protein

C. Oxalic acid

D. Tripalmitin

Answer:



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

- A. glucosynthetase
- B. phosphorylase
- C. glucose-6-phosphotase
- D. hexokinase

Answer:



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61. Glycolysis consists of three major events.

They are

A. Phosphorylation-Cleavage-oxidation

B. acetylation-phosphorylation-Reduction

C. Oxidation-phosphorylation-Reduction

D. Acetylation-Dephosphorylation-

Hydrolysis

Answer:



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62. Second step of substrate level phosphorylation in EMP pathway is catalysed by

- A. Phosphoglyceromutase
- B. Triose phosphate isomerase
- C. Phosphoglycerokinase
- D. Pyruvic kinase

Answer:



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63. The ultimate end products of glycolysis are

A. CO_2

B. H_2O

C. Pyruvic acids

D. O_2

Answer:



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64. Glycolysis and krebs cycle occurs

A. in presence of oxygen

B. in absence of oxygen

C. in presence of CO_2

D. in presenece of chloroplast

Answer:



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65. Which of the following is not involved in the preparatory phase of glycolysis

A. dephosphorylation

B. cleavage

C. use of ATP

D. isomerization

Answer:



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66. End product of glycolysis used 'as starting substrate for

- A. oxidative decarboxylation of pyruvic acid
- B. phase II of anaerobic respiration
- C. phase of connection link
- D. All of these

Answer:



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67. In EMP pathway after the cleavage stage

A. dephosphorylation occurs twice

B. Phosphorylation occurs once

C. oxidation occurs once

D. All of these

Answer:



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68. Conversion of 3- PGA to 2- PGA in glycolysis is an example for

- A. Phosphorylation
- B. Intramolecular shift
- C. Dehydration
- D. Cleavage

Answer:



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69. In glycolysis phosphorylation takes place in

A. 3 steps

B. 2 steps

C. 1 step

D. 4 steps

Answer:



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70. For every molecule of glucose during glycolysis the ratio between pyruvic acid liberated and net gain ATP molecules formed is

A. 1:1

B. 1:2

C. 1:3

D. 1:4

Answer:



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71. In glycolysis first the 3-C compounds formed during...and last during....

A. Fructose 1,6 Diphosphate to DHAP and

PGAL, PEP to pyruvic acid

B. Fructose 1,6 Diphosphate to DHAP

and PGAL, 3PGA to 2PGA

C. Fructose 1,6Diphosphate-to'DHAP and

PGAL, PEP to 2 PGA

D. Fructose 1,6 Diphosphate to DHAP and

PGAL, PGAL to 1,3DiPGA

Answer:



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72. Identify the **WRONG** statement with reference to glycolysis

A. it is common step for aerobic and anaerobic respiration

B. it involves removal of CO_2 and use of

O_2

C. total gain of ATP is 8 ATP for aerobic and

2 ATP for anaerobic

D. Direct synthesis, of ATP by substrate

level phosphorylation

Answer:



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73. The substrate level phosphorylation in EMP pathway takes place during

A. Glucose \rightarrow G. 6.P

B. 1, 3 DiPGA \rightarrow 3 PGA

C. PEP-Pyruvic acid

D. Both b and c

Answer:



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74. Glucose is converted into pyruvic acid through a series of reactions with a net gain of.. without ETS

A. 2 molecules of ATP

B. 8 Molecules of ATP

C. 6 molecules of ATP

D. 38 molecules of ATP

Answer:



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75. Point out the wrong one from the following

- A. Pyruvic acid undergoes decarboxylation in both aerobic and anaerobic respiration
- B. In aerobic and anaerobic glycolysis' occurs in cytosol
- C. In both respirations glucose gives two pyruvic acids
- D. Total formed ATP through glycolysis per one glucose equal to formed $NADH_2$

by TCA

Answer:



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76. How many ATP molecules are required for the activation of glucose and fructose during respiratory process?

A. 1

B. 2

C. 3

D. 4

Answer:



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77. The net gain of glycolysis of one molecule of glucose is the formation of

A. 1 $NADH_2$ and 6 ATP

B. 2 $NADH_2$ and 2 ATP

C. 4 $NADH_2$ and 2 ATP

D. 2 $NADH_2$ and 8 ATP

Answer:



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78. In which of the following step ATP can be produced?

A. Glucose \rightarrow Fructose

B. Phosphoenol Pyruvic acid → Pyruvic acid

C. Fumaric acid → Malic acid

D. Fructose → Fructose 6 phosphate

Answer:



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79. In glycolysis, during the formation of 1-3-Di PGA from 3 PGAL..... Is used, andis formed.

A. H_3PO_4 and $NADH_2$

B. $NADH_2$ and ATP

C. ATP and $NADH_2$

D. ADP and $NADH_2$

Answer:



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80. How many decarboxylation steps present during glycolysis?

A. 6

B. 2

C. 3

D. 0

Answer:



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81. Substrate level phosphorylation occurs during Glycolysis per glucose

A. twice, one step

B. once, in two steps

C. three, two steps

D. four times in two steps

Answer:



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82. If fructose 1,6-biphosphatase participate in glycolysis the net gain of ATP will be

A. 1

B. 2

C. 3

D. 4

Answer:



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83. The conversion of glucose-6- phosphate-to Fructose-6- Phosphate is catalyzed by

A. Hexokinase

B. Aldolase

C. Isomerase

D. Kinase

Answer:



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84. Which of the following equation represent final phosphorylation step from glycolysis?

A. Fructose

6P+Atp

→

Fructose1,6bisP+ADP

B. 1,3 diPGA+ADP → 3PGA+ATP

C. PEPA+ADP → Pyruvic acid+ATP

D. Glucose+ATP → Glucose 6p+ADP

Answer:



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85. In aerobic respiration decarboxylation takes place at (i) Glycolysis (ii) Kerbs' cycle (iii)

In between glycolysis and Krebs' cycle

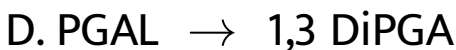
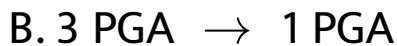
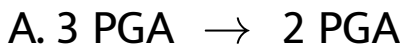
- A. II alone is correct
- B. II and III are correct
- C. I and II are correct
- D. I and III are correct

Answer:



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86. Which of the following is called as position isomerisation and is irreversible step of glycolysis



Answer:



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87. Choose the correct sequence of reactions of glycolysis (I) Dehydration (II) Oxidation (III) Phosphorylation (IV) Cleavage

A. I, IV, III, I

B. III, IV, II, I

C. IV, I, III, II

D. III,IV,II

Answer:



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88. Which of the following are isomers?

A. 3 PGA \rightarrow 2 PGA

B. PGAL \rightarrow DHAP

C. Glucose-6P \rightarrow fructose-6P

D. All of these

Answer:



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89. In glycolysis during cleavage which two compound are formed ?

A. 3-PGA, DHAP

B. 3-PGAL, DHAP

C. DHAP, PEP

D. 3-PGA, 3-PGAL

Answer:



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90. In intermediate compound common for aerobic and anaerobic respiration

- A. Acetyl COA
- B. pyruvic acid
- C. oxaloactic acid
- D. succinic acid

Answer:



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91. The connecting link reaction between glycolysis and Krebs's cycle occurs in

- A. Cytosol
- B. Peroxisomes
- C. Cristae
- D. Mitochondrial matrix

Answer:



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92. 2 carbon compound acts as connecting link between glycolysis and krebs cycle is

A. Pyruvic acid

B. Citric acid

C. Acetyl Co.A

D. Thiamine pyrophosphate

Answer:



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93. Number of carbon atoms in pyruvic acid is

A. 3

B. 2

C. 6

D. 5

Answer:



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94. The compound which is connecting link reaction between glycolysis and Krebs cycle is

A. OAA

B. acetyl Co-A

C. pyruvic acid

D. citric acid

Answer:



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

A. acetaldehyd

B. acetyl Co-A

C. OAA

D. citric acid

Answer:



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96. The formation of Acetyl CoA from pyruvic acid is called

A. TCA cycle

B. Transition reaction

C. Glycolysis

D. Substrate Phosphorylation

Answer:



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97. In aerobic respiration first CO₂ is liberated during

- A. oxidative decarboxylation of pyruvic acid
- B. decarboxylation of malic to pyruvic acid
- C. decarboxylation of *Alpha*- Ketoglutarate
- D. decarboxylation of Oxalosuccinic acid

Answer:



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98. The QRS complex in a standard ECG represents

- A. Depolarisation of ventricles
- B. Repolarisation of ventricles
- C. Repolarisation of auricles
- D. Depolarisation of auricles

Answer:



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99. The number of substrate level phosphorylations in the one turn of citric acid cycle is

A. Two

B. Three

C. Zero

D. One

Answer:



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100. Select the correct events that occur during inspiration (i) Contraction of diaphragm (ii) Contraction of external intercostal muscles (iii) Pulmonary volume decreases (iv) Intra pulmonary pressure increases

A. 'i', 'ii' and 'iv'

B. only 'iv'

C. 'i' and 'ii'

D. 'iii' and 'iv'

Answer:



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101. The reactions of the TCA cycle occur in..... .

A. ribosomes

B. grana

C. mitochondria

D. endoplasmic reticulum

Answer:



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102. In eucaryotes the complete oxidation of a molecule of glucose results in the net gain of.

A. 2 molecules of ATP

B. 36 molecules of ATP

C. 4 molecules of ATP

D. 38 molecules of ATP

Answer:



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103. The intermediate between glycolysis and TCA cycle is

- A. 6 molecule of ATP
- B. 36 molecule of ATP
- C. 4 molecules of ATP
- D. 38 molecule of ATP

Answer:



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104. Do you know any step in the TCA cycle where there is substrate level phosphorylation. Which one?

A. α - ketoglutarate \rightarrow succinylCoA

B. SuccinylCoA \rightarrow succinate

C. Succinate \rightarrow fumarate

D. Fumarate \rightarrow malate

Answer:



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105. Which of the following steps of aerobic respiration would be omitted when fatty acids are used as respiratory substrate?

- A. Glycolysis
- B. Krebs cycle
- C. Electron transfer chain reaction
- D. Terminal oxidation

Answer:



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106. Respiration differs from the process of combustion in the fact respiration shows

A. All the energy stored in glucose is released at once due to combustion

B. All energy stored in glucose is gradually released due to combustion

C. large amount of energy is released than
combustion

D. The carbohydrates act as the
combustion substance

Answer:



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107. ATP is called as

A. energy currency

B. energy coin

C. simple energy mediator

D. all of these

Answer:



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108. Mark the wrong statement

A. outer membrane is smooth, freely permeable to small molecules

B. porin protein forms channel to make membrane permeable

C. Outer membrane is continuous & inner membrane is folded

D. Outer membrane is folded & inner membrane is continuous

Answer:



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109. Which of the following is Not true about cristae

A. greatly increase inner surface of mitochondria

B. cristae are tubular in plants & plate like in animals

C. cristae in closes intra cristal space which to outer chamber

D. cristae are the sites of Kreb's cycle

Answer:



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110. ETS and TCA enzymes occur in

- A. Cytoplasm
- B. Cytosol
- C. mitochondria
- D. Cytoplasm

Answer:



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111. The site of ATP generation in mitochondria is

- A. F_1 particles
- B. base piece of oxysome
- C. matrix
- D. outer membrane

Answer:



112. All of the following are present in matrix except

- A. 70S ribosome
- B. 2-6 circular DNA molecules
- C. most of the enzyme of Kreb's cycle
- D. electron carriers of ETS

Answer:



113. Mitochondria is a semi-autonomous cell organelle as it contains

A. F_1 particles

B. ATP synthetase

C. DNA

D. enzymes for kreb's cycle

Answer:



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114. Why glycolysis is common pathway of aerobic & anaerobic respiration

- A. takes place in cytoplasm
- B. does not require mitochondria
- C. does not require free O_2
- D. all of these

Answer:



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115. Second step of substrate level phosphorylation in EMP pathway is catalysed by

- A. Phosphoglyceromutase
- B. Triose phosphate isomerase
- C. Phosphoglycerokinase
- D. Pyruvic kinase

Answer:



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116. Which of the following is not involved in the preparatory phase of glycolysis

A. Phosphorylation

B. cleavage

C. use of ATP

D. Isomerization

Answer:



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117. End product of glycolysis used 'as starting substrate for

A. oxidative decarboxylation of pyruvic acid

B. phase II of anaerobic respiration

C. phase of connecting link

D. all of these

Answer:



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118. In glycolysis first the 3-C compounds formed during...and last during...

A. Fructose 1,6 Diphosphate to DHAP & PGL,
PEP to pyruvic acid

B. Fructose 1,6 Diphosphate to DHAP &
PGAL,

C. Fructose 1,6 Diphosphate to DHAP &
PGAL, 3PGA to 2PGA

D. Fructose 1,6 Diphosphate to DHAP &
PGAL, PGAL to 1,3 DiPGA

Answer:



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119. Identify the **WRONG** statement with reference to glycolysis

A. It is common step for aerobic & anaerobic respiration

B. It involves removal of CO_2 & use of O_2

C. total gain of ATP is 8 ATP for aerobic & 2

ATP for anaerobic

D. Direct synthesis of ATP by substrate level

phosphorylation

Answer:



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120. Point out the wrong one from the following

A. pyruvic acid undergoes decarboxylation in both aerobic and anaerobic respiration

B. In aerobic and anaerobic glycolysis occurs in cytosol

C. In both respiration glucose gives two pyruvic acids

D. total formed ATP through glycolysis per one glucose equal to formed $NADH_2$ by TCA

Answer:



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121. Choose the correct sequence of reactions of glycolysis (I) Dehydration (II) Oxidation (III) Phosphorylation (IV) Cleavage

A. I,IV,III,I

B. III,IV,II,I

C. IV,I,III,II

D. III,IV,II

Answer:



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122. For the conversion of Pyruvic acid into A.

Co 'A' requires

A. TPP (Thiamine pyrophosphate)

B. Lipoic acid, M^{+} +

C. Co-A and NAD

D. All of above

Answer:



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123. Krebs cycle starts with the formation of 6-c compound by a reaction between.

- A. malic acid and acetyl coenzyme
- B. oxaloacetic acid and acetyl Co-A
- C. succinic acid and Succinyl Co-A
- D. fumaric acid and malic acid

Answer:



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124. In Krebs cycle pyruvic acid, acetyl Co-A, Alpha ketoglutaric, succinic acid has carbon

A. 3,2,5,6

B. 2,3,5,6

C. 3,2,5,4

D. 3,5,4,6

Answer:



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125. Number of carbon atoms present in Malic acid, oxaloacetic acid, acetyl Co-A, citric acid respectively.

A. 4,2,4 and 6

B. 4,4,2 and 6

C. 6,4,2 and 4

D. 4,4,3 and 6

Answer:



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126. In TCA, GTP is formed during the conversion of

- A. succinly CoA to succinic acid
- B. malic acid to OAA
- C. a-ketoglutaric acid to succinly co-A
- D. succinic acid to fumaric acid

Answer:



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127. The last product of citric acid cycle is

A. last product of glycolysis

B. last product of oxidative decarboxylation

C. first formed product in Hatch-Salck
pathway

D. First formed in glycolysis

Answer:



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128. The only 5 carbon compound in TCA cycle and undergo oxidative decarboxylation is

- A. Cis-aconitic acid Succinic acid
- B. Succinic acid
- C. α -ketoglutaric acid
- D. oxalosuccinic acid

Answer:



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129. Lowest energy yield is seen in this reaction

A. succinly CoA \rightarrow succinic acid

B. malic acid \rightarrow oxaloacetic acid

C. isocitric acid \rightarrow oxalosuccinic acid

D. pyruvic acid \rightarrow acetyl Co. A

Answer:



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130. Substrate level phosphorylation SLP takes place in

- A. EMP and ETS
- B. EMP and TCA
- C. ETS and Acetylation
- D. TCA and Acetylation

Answer:



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131. Anaerobic respiration is completed in following three steps:

A. Glycolysis, decarboxylation and terminal oxidation

B. Glycolysis, oxidative decarboxylation and reduction

C. Glycolysis, oxidative decarboxylation and
Krebs cycle

D. Glycolysis, decarboxylation and
reduction

Answer:



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132. Out of 38 ATP molecules how many ATP molecules are formed by cristae

A. 38

B. 8

C. 30

D. 34

Answer:



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133. The mechanism of ATP synthesis in mitochondria is called as terminal oxidation,

ATP synthesis takes place by the oxidation of reduced co-enzymes, called

- A. Photophosphorylation
- B. Substrate phosphorylation
- C. Oxidative phosphorylation
- D. Surface phosphorylation

Answer:



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134. In ETS, $FADH_2$ are oxidized to produce molecules..

A. 2 ATP

B. 4 ATP

C. 6 ATP

D. 2 GTP

Answer:



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135. In aerobic respiration the oxidation is complete because there is

A. hydrogens are coenzymes used by cytochrome

B. Free oxygen to accept hydrogen released in the process to form water

C. energy is released only in this process

D. water is utilized & energy is released

Answer:



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136. According to Mitchell ATP synthesis occurs due to

- A. H^+ flow through membrane
- B. Flow of oxygen through membrane
- C. Flow of enzymes through membrane
- D. Flow of ADP through membrane

Answer:



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

A. Cytochrome

B. Oxygen

C. Hydrogen

D. Glucose

Answer:



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138. Phosphorylation of glucose during glycolysis is catalysed by

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

Answer:



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139. 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:



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140. Electron Transport System (ETS) is located in mitochondrial

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

Answer:



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141. Which of the following exhibits the highest rate of respiration?

A. Growing shoot apex

B. Germinating seed

C. Root tip

D. Leaf bud

Answer:



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142. 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. There is complete breakdown of glucose in fermentation

Answer:



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143. Mitochondria are called power houses of the cell. Which of the following observations support this statement?

- A. Mitochondria synthesis 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 animals cells

Answer:



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144. The end product of oxidative phosphorylation is

A. NADH

B. Oxygen

C. ADP

D. ATP + H_2O

Answer:



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145. Match the following and choose the correct option from those given below

| Column A | Column B |
|---------------------------|---------------------------------|
| A) Molecular oxygen | i. α - Ketoglutaric acid |
| B) Electron acceptor | ii. hydrogen acceptor |
| C) Pyruvate dehydrogenase | iii. cytochrome C |
| D) Decarboxylation | 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-iii, D-iv

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

Answer:



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Example

1. Which nutrients are used for energy production?



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2. Two steps of anaerobic respiration



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3. How would you demonstrate that yeast can respire both aerobically and anaerobically?



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4. Why mitochondria is called as power house of cell chamber



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5. Common step of aerobic and anaerobic respiration.



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6. What is the ratio of ATP produced for one glucose molecule in anaerobic respiration and aerobic respiration?



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7. Which process is called as catabolic, energy releasing process?



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8. Maximum energy is released in which type of respiration?



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9. Fill in the blanks: Acetyl CoA is formed from.....and co-enzyme A.



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10. Fill in the blanks: In the prokaryotes.....
molecules of ATP are formed per molecule of
glucose oxidised.



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11. Fill in the blanks: Glycolysis takes place
in..... .



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12. Fill in the blanks: $F_1 - F_0$ particles participate in the synthesis of..... .



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13. Fill in the blanks: During glycolysis.....molecule of $NADH$ are formed.



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



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15. Energy currency of the cell



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

$$R.Q = A/B$$

What do A and B stand for?

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



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17. Fill in the blanks: $F_1 - F_0$ particles participate in the synthesis of..... .



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18. When and where does anaerobic respiration occur in man and yeast?



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

ascending order:

1 gm of fat

1 gm of protein

1 gm of glucose

0.5 g of protein + 0.5 g glucose.



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20. The product of aerobic glycolysis in skeletal muscle and anaerobic fermentation in yeast are respectively _____ and _____.



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21. Which nutrients are used for energy production?



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22. Why do organisms take up oxygen and release carbondioxide?



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23. What is aerobic and anaerobic respiration?



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24. When and where does anaerobic respiration occur in man and yeast?



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25. Athletes who participate in events like marathon or swimming over long distance

have higher proportion of red fibres.



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26. Why is less energy produced during anaerobic respiration than in aerobic respiration?



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27. Where is the respiratory electron transport system located in a cell?



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28. Which compound is the terminal electron acceptor in aerobic respiration?



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29. What is RQ? What is its value for fats?



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



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31. Write explanatory notes on:

Glycolysis



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32. Write explanatory notes on fermentation by yeast.



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33. What is an electron transport chain?



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34. How are glycolysis, TCA cycle and electron transport chain linked? Explain.



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35. What is the advantage of step wise energy release in respiration?



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36. Why is Kreb's cycle referred to as an amphibolic pathway?



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



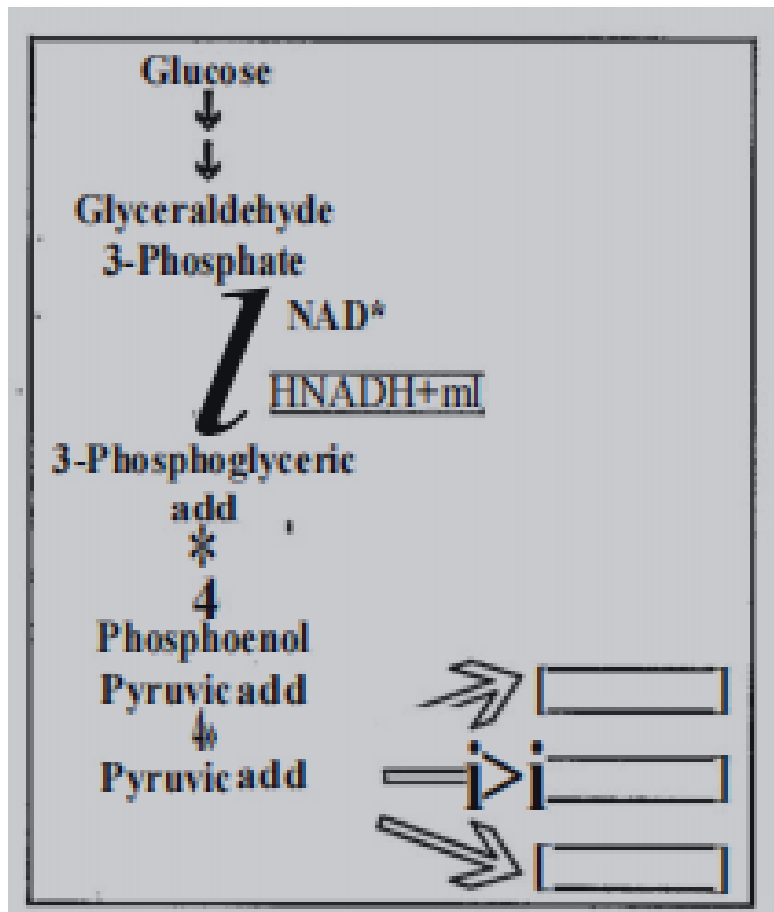
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38. What is meant by the statement "aerobic respiration is more efficient."?



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39. Pyruvic acid is the end product of glycolysis, what are the three metabolic fates of pyruvic acid under aerobic and anaerobic conditions? Write in the space provided in the diagram.





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40. The energy yield in terms of ATP is higher in aerobic respiration than during anaerobic respiration. Why is there anaerobic respiration even in organisms that live in aerobic condition like human beings and angiosperms?



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



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42. Respiration is an energy releasing and enzymatically controlled catabolic process which involves a step-wise oxidative breakdown of organic substances inside living cells. In this, statement about respiration

explain the meaning of

Step-wise oxidative breakdown.



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43. Respiration is an energy releasing and enzymatically controlled catabolic process which involves a step-wise oxidative breakdown of organic substances inside living cells. In this, statement about respiration explain the meaning of

Organic substances (used as substrates)



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



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



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46. Why is Kreb's cycle referred to as an amphibolic pathway?



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47. ATP produced during glycolysis is a result of substrate level phosphorylation. Explain.



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48. Do you know any step in the TCA cycle where there is substrate level phosphorylation. Which one?



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



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50. What is the advantage of step wise energy release in respiration?



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51. Respiration requires O_2 . How did the first cells on the earth manage to survive in an atmosphere that lacked O_2 ?



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52. Red muscle fibres in animals can work continuously for long periods of time'. Discuss.



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53. Why is less energy produced during anaerobic respiration than in aerobic respiration?



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54. RuBP carboxylase, PEPcase, Pyruvate dehydrogenase, ATPase, cytochrome oxidase, Hexokinase, dehydrogenase. Select/choose enzymes from the list above which are involved in Photosynthesis



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55. RuBP carboxylase, PEPcase, Pyruvate dehydrogenase, ATPase, cytochrome oxidase,

Hexokinase, dehydrogenase. Select/choose enzymes from the list above which are involved in Respiration



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56. RuBP carboxylase, PEPcase, Pyruvate dehydrogenase, ATPase, cytochrome oxidase, Hexokinase, dehydrogenase. Select/choose enzymes from the list above which are involved

in

Both in photosynthesis and respiration.



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



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58. Write two energy yielding reactions of glycolysis.



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59. Name the site (s) of pyruvate synthesis.

Also write the chemical reaction where in pyruvic acid dehydrogenase acts as a catalyst.



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60. Mention the important series of events of aerobic respiration that occur in the matrix of the mitochondrion as well as one that take

place in inner membrane of the mitochondrion.



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61. Why is Krebs's cycle referred to as an amphibolic pathway?



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62. Why is Krebs's cycle referred to as an amphibolic pathway?



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63. Distinguish between the following.
Photosynthesis and Respiration.



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64. What is aerobic and anaerobic respiration?



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65. Differentiate between

Respiration and combustion.



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66. Glycolysis and krebs cycle occurs



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67. Differentiate between

Aerobic respiration and fermentation.



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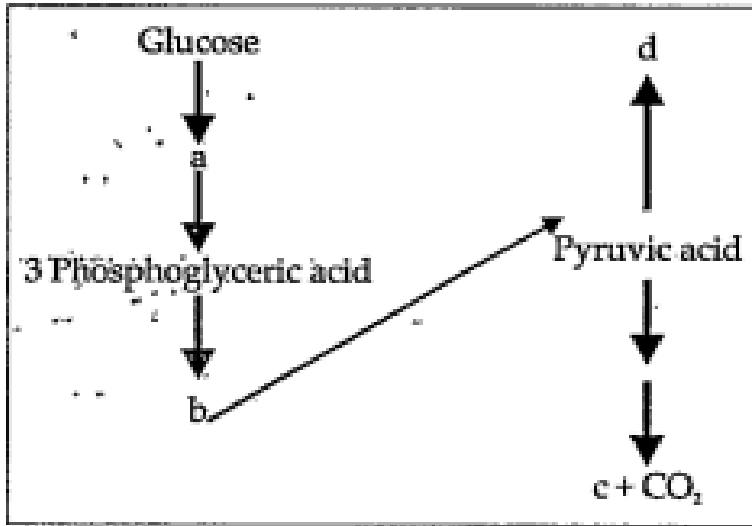
68. What is oxidative phosphorylation?



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

application of it.



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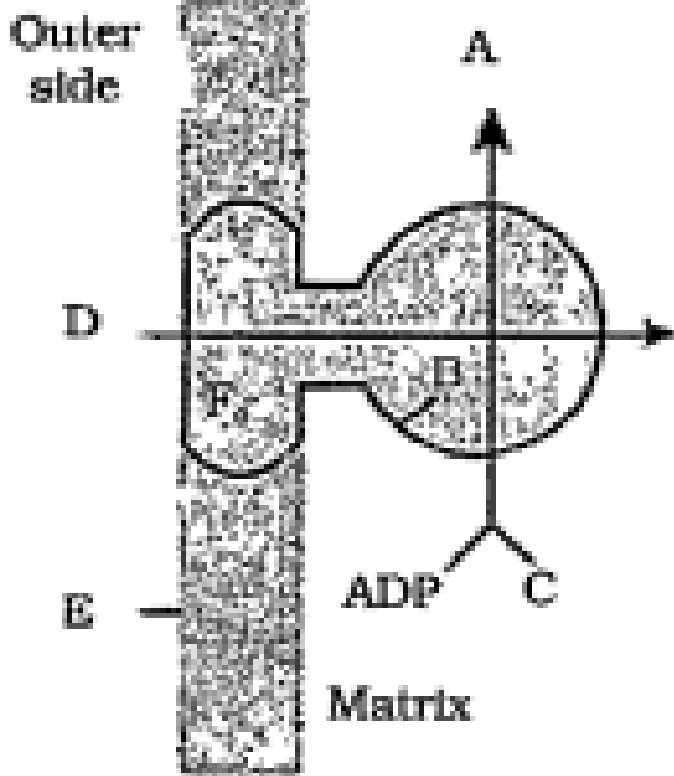
70. Enumerate the assumptions that we undertake in making the respiratory balance sheet. Are these assumptions valid for a living

system? Compare fermentation and aerobic respiration in this context.



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71. Given below is a diagram showing ATP synthesis during aerobic respiration, v replace the symbols A, B, C, D and E by appropriate terms given in the box



F₁,

particle, P_i , 2H^+ Inner mitochondrial membrane, ATP, F_0 particle, ADP.



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72. Oxygen is critical for aerobic respiration'.

Explain its role in ETS.



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73. Glycolysis represents the common step of aerobic and anaerobic respiration. It does



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74. Differentiate between

Respiration and combustion.



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75. Distinguish between Glycolysis and TCA

cycle :



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76. Differentiate between

Aerobic respiration and fermentation.



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



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78. What are the main steps of aerobic respiration? Where do they take place?



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79. With the help of a schematic representation describe glycolysis.



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80. Give the overall equation of Krebs's cycle.



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81. Oxygen is critical for aerobic respiration.

Explain its role in ETS.



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82. Distinguish between the following:

Aerobic respiration and Anaerobic respiration.



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83. Distinguish between the following. Glycolysis and Fermentation.



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84. Distinguish between the following:
Glycolysis and Citric acid cycle.



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85. What are the assumption made during the calculation of net gain of ATP?



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86. Why is Kreb's cycle referred to as an amphibolic pathway?



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87. Respiratory quotient (RQ)

RQ value is unity.



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88. Respiratory quotient (RQ)

RQ value infinity.



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89. Respiratory quotient (RQ)

RQ value zero.



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90. Respiratory quotient (RQ)

RQ value is unity.



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91. What is oxidative phosphorylation?



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92. What is the advantage of step wise energy release in respiration?



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