TOPIC

CELLULAR RESPIRATION

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1. **The 'lysis' of which molecule results in the formation of two molecules of 3-C compounds in EMP pathway?**

a) Glucose

b) Glucose 6-phosphate

c) Fructose 6-phosphate

d) Fructose 1, 6-bisphosphate

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2) Glycolysis occurs in

a) Cytoplasm

b) Mitochondria

c) Ribosomes

d) Golgi complex

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3) The conversion of pyruvate molecule into acetyl CoA occurs in

a) cytosol

b) mitochondria

c) Golgi complex

d) chloroplast

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4) The Krebs cycle occurs in

a) Cytoplasm

b) mitochondria

c) Ribosomes

d) chloroplast

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5. The volume of CO_2 evolved in respiration is equal to the volume of O_2 consumed, the respiratory substrate is

a) Protein

b) Carbohydrate

c) Organic acid

d) fat

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6.Which of the following molecules are formed as aresult of glycolysis?

a) 2-ATP and 2-NADH molecules
b) 2-pyruvate and 2-NADH molecules
c) 2-ATP, 2-pyruvate and 2-NADH molecules
d) None of the above

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7. Which of the following representations correctly explains the function of mitochondria [M] ?

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a) O_2, ADP, phosphate → [M] → H_2O, ATP, CO_2

b) O_2, ADP, phosphate → [M] → H_2O, AMP, CO_2

c) CO_2, ADP, Phosphate → [M] → H_2O, AMP, O_2

d) CO_2, ADP, Phosphate → [M] → H_2O, ATP, O_2

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8. In glycolysis NADH is produced during the conversion of

a) 1,3-bisphosphoglyceric acid to 3-phosphoglyceraldehyde

b) 3-phosphoglyceraldehyde to 1,3-bisphosphoglyceric acid

c) 2-phosphoenol pyruvate to pyruvate

d) 3-phosphoglyceric acid to 2-phosphoglyceric acid

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9. Which of the following is true with regard to glycolysis ?

a) Only NADH molecules are formed in glycolysis

b) Only ATP molecules are formed in glycolysis

c) Glycolysis is aerobic process

d) Glycolysis is anaerobic process

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10. The correct sequence in Krebs cycle is

a) Succinic acid → Malic acid → Fumaric acid → oxaloacetic acid

b) Succinic acid → Fumaric acid → Malic acid → oxaloacetic acid

c) Fumaric acid → Malic acid → Succinic acid → oxaloacetic acid

d) Malic acid → Succinic acid → Fumaric acid

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11. The formation of acetyl CoA from pyruvic acid is the result of its

a) Dehydration

b) Reduction

c) Dephosphorylation

d) Oxidative decarboxylation

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12. Which of the following forms the connecting link between glycolysis and Krebs cycle?

a) Pyruvic acid

b) Lactic acid

c) Acetyl CoA

d) Oxalo acetic acid

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13. The pyruvic acid is produced at the end of

a) Krebs cycle

b) Calvin cycle

c) Glycolysis

d) Oxygen cycle

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14. The overall equation of alcoholic fermentation is

a) $C_6H_{12}O_6 \longrightarrow 2C_2H_5OH + 2CO_2 + 2ATP$

b) $C_6H_{12}O_6 \longrightarrow 2C_2H_5OH + 2CO_2 + 4ATP$

c) $C_6H_{12}O_6 + 6O2 \longrightarrow 6CO_2 + 6H_2O + 2ATP$

d) $C_6H_{12}O_6 + 6O2 \longrightarrow 6CO_2 + 6H_2O + 38ATP$

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15. The correct sequence of processes occurring in aerobic respiration is

a) Glycolysis -> Krebs cycle -> preparatory reactions of Krebs cycle -> electron transport

b) Krebs cycle -> Glycolysis -> preparatory reactions of Krebs cycle -> electron transport

c) Glycolysis -> preparatory reactions of Krebs cycle -> Krebs cycle -> electron transport

d) None of the above

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16. The common phase of aerobic and anaerobic respiration is

a) Calvin cycle

b) Oxidative phosphorylation

c) Krebs cycle

d) Glycolysis

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17. The final electron acceptor in aerobic respiration is

a) Hydrogen
b) Oxygen
c) Carbon dioxide
d) water

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18. The total number of ATP molecules produced for every glucose molecule in aerobic respiration is

a) 34

b) 36

c) 38

d) 32

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19. Which of the following conversion does not evolve carbon dioxide?

a) Fumaric acid to malic acid
b) Pyruvic acid to acetyl CoA
c) Oxalosuccinic acid to α -ketoglutaric acid
d) α-ketoglutaric acid to succinyl CoA

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20. The initial compound of EMP pathway is

a) Pyruvic acid

b) Acetyl CoA

c) Fructose

d) Glucose

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21. The end products of fermentation are

a) Oxygen and ethyl alcohol

b) Oxygen and acetaldehyde

c) CO_2 and ethyl alcohol

d) Acetaldehyde and CO_2

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22. Which of the following is not true with respect to alcoholic fermentation of a glucose molecule?

a) It is seen in yeast cells
b) Ethanol and CO_2 are end products
c) 6-ATP molecules are formed
d) 2-ATP molecules are formed

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23. Glycolysis is also called

a) EMP pathway

b) Calvin cycle

c) Tricarboxylic acid cycle

d) C_4 cycle

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24. RQ of anaerobic respiration is

a) One
b) Less than one
c) More than one
d) infinity

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25. Ganong's respiroscope is used to demonstrate evolution of

a) CO_2 during fermentation

b) O_2 during fermentation

c) CO_2 during aerobic respiration

d) CO_2 during anaerobic respiration

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26. The components of cell involved in aerobic respiration is/are

a) Only cytoplasm

b) Only mitochondria

c) Both cytoplasm and mitochondria

d) None of the above

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27. The Number of water molecules produced in glycolysis is

a) four

b) three

c) two

d) one

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28. RQ is more than one in case of

a) Fat
b) Organic acids
c) Glucose
d) fructose

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29. The correct representation of aerobic respiration is

a) $C_6H_{12}O_6 + 6O_2 \longrightarrow 6CO_2 + 6H_2O + 36ATP$

b) $C_6H_{12}O_6 + 6O_2 \longrightarrow 6CO_2 + 6H_2O + 38ATP$

c) $C_6H_{12}O_6 + 6O_2 \longrightarrow 6CO_2 + 6H_2O + 34ATP$

d) $C_6H_{12}O_6 \longrightarrow 2C_2H_5OH + 2CO_2 + 2ATP$

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30. The number of ATP molecules gained in glycolysis is

a) two

b) four

c) eight

d) ten

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31. Mitochondria are the sites of

a) photophosphorylation

b) oxidative phosphorylation

c) transpiration

d) glycolysis

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32. The end products of aerobic respiration in plants are

a) CO_2 and H_2O

b) CO_2 and energy

c) H_2O and energy

d) CO_2, H_2O and energy

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33. In Krebs cycle, a 6-C compound is formed by the combination of acetyl CoA and

a) Citric acid

b) Oxaloacetic acid

c) Succinic acid

d) Malic acid

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34. A change from an anaerobic process to an aerobic process is called

a) Tyndall effect

b) Emerson effect

c) Pasteur effect

d) Blackman's law

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35. The bond formed between first phosphate group and adenosine in ATP is

a) Hydrogen bond

b) Adeno phosphate bond

c) Phosphoanhydride bond

d) Phosphoester bond

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36. Respiratory quotient (RQ) is represented by the ratio of volume of

a) O_2 liberated to CO_2 consumed
b) CO_2 liberated to O_2 consumed
c) H_2O liberated to CO_2 consumed
d) O_2 liberated to H_2O consumed

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37. Electron transport system in mitochondria is located in its

a) Outer membrane
b) Inner membrane
c) Inter membrane space
d) Matrix

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38. The amount of energy released during the hydrolysis of high energy bond of ATP is

a) 73 K.cal / mol

b) 0.73 K.cal / mol

c) 7.3 K.cal / mol

d) 3.7 K.cal / mol

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39. The approximate energy liberated during the conversion of ATP to ADP is

a) 73,000 Cal

b) 7300 Cal

c) 730 Cal

d) 73 Cal

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40. Anaerobic respiration takes place in

a) Ribosome

b) Mitochondria

c) Vacuole

d) cytoplasm

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41. RQ of anaerobic respiration of glucose is

a) one

b) less than one

c) more than one

d) infinity

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42. Total number of NADH molecules produced in glycolysis is

a) two
b) four
c) six
d) seven

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43. Total number of NADH molecules produced in Krebs cycle for one molecule of glucose is

a) 10

b) 8

c) 6

d) 3

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44. In plants,respiration occurs

a) only in non-green cells in light

b) only in non-green cells in dark

c) in all living cells in dark and light

d) in all living cells only in light

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45. Total number of CO_2 molecules released during Krebs cycle for one molecule of pyruvate is

a) two

b) four

c) six

d) eight

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46. Which one of the following occurs during the conversion of 2-phosphoglycerate to phosphoenol pyruvate in glycolysis

a) dephosphorylation
b) rearrangement
c) dehydration
d) phosphorylation

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47.In Krebs cycle the hydrogen ions removed at succinic acid level are accepted by

a) NAD

b) ADP

c) ATP

d) FAD

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48. The enzyme of the yeast that converts glucose into ethyl alcohol is

a) Sucrase

b) Maltase

c) Invertase

d) zymase

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49. The anaerobic process that occurs after glycolysis in aerobic respiration is

a) Ornithine cycle

b) Calvin cycle

c) Krebs cycle

d) None of the above

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50. Match the substrates of aerobic respiration given in column-I with their R.Q given in column - II; choose the answer which gives correct combination

COLUMN-I	COLUMN-II
1) Carbohydrate	p) 0.7
2) Protein	q) More than one
3) Fat	r) 1
4) Organic acids	s) 0.9

a) 1=p, 2=q, 3=s, 4=r

b) 1=s, 2=q, 3=p, 4=r

c) 1=r, 2=s, 3=p, 4=q

d) 1=r, 2=s, 3=q, 4=p

51. Synthesis of ATP in mitochondria takes place

a) in its inter membrane space
b) in its outer membrane
c) at the cristae
d) in its matrix

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52. Pressure developed by the process of fermentation in a closed vessel is due to the accumulation of

a) CO_2 in the vessel

b) O_2 in the vessel

c) water in the vessel

d) vaccum in the vessel

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53. The gas /gases taken into cells in aerobic respiration is /are

a) carbon dioxide
b) oxygen
c) O_2 & CO_2
d) none of the above

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54.The gas taken into the cells in anaerobic respiration is

a) oxygen
b) carbon dioxide
c) both a & b
d) none of the above

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55.The pyruvic acid before combining with oxaloacetic acid of TCA cycle becomes

a) lactic acid

b) cis acotinic acid

c) acetic acid

d) acetyl CoA

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56.The number of carbon atoms present in pyruvic acid is

a) six
b) two
c) three
d) five

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57. Oxidative phosphorylation occurs during the process of

a) photosynthesis
b) respiration
c) protein synthesis
d) none of the above

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58.In ETS, the reduced coenzymes are regenerated by

a) loss of hydrogen
b) loss of electron
c) loss of oxygen
d) None of the above

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59. The number of carbon atoms entering Krebs cycle from one molecule of pyruvate is

a) two
b) three
c) four
d) six

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60.In which of the following the electron transport occurs ?

a) phytochromes
b) cytochromes
c) cytoplasm
d) enzymes

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61. The substrate level phosphorylation occurs during the conversion of

a) succinyl CoA to succinic acid
b) malic acid to oxaloacetic acid
c) succinic acid to fumaric acid
d) fumaric acid to malic acid

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62. Which one of the following statements is false about respiration ?

a) carbon dioxide is released
b) energy is released
c) fuel molecules are broken down
d) none of the above

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63. The materials required to demonstrate fermentation by Kuhne's fermenter is / are

a) Kuhne's fermentation tube
b) Yeast cells
c) 10% glucose solution
d) All the above

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64. The $FADH_2$ molecule in Krebs cycle is produced during the conversion of succinate into

a) succinyl CoA
b) malate
c) fumarate
d) citrate

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65.The only five- carbon compound formed in Krebs cycle is

a) citrate

b) alpha-ketoglutarate

c) malate

d) oxalo acetate

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66. Which of the following is not true with respect to TCA cycle ?

a) occurs in matrix of mitochondria

b) requires oxygen

c) CO_2 is released

d) also called Krebs cycle

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67. The number of CO_2 molecules formed in one Krebs cycle is

a) four

b) three

c) two

d) one

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68. The number of ATP molecules generated from succinyl CoA in one Krebs cycle is

a) two

b) one

c) three

d) none

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69. The number of Krebs cycles occurring for each glucose molecule is

a) one

b) two

c) three

d) four

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70.In Krebs cycle, alpha-ketoglutaric acid is subjected to

a) dehydrogenation

b) oxidative phosphorylation

c) decarboxylation

d) oxidative decarboxylation

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71. The reactions of EMP pathway is named after

a) Embden, Meselson and Parnas

b) Embden, Mayerhof and Parnas

c) Emerson, Mc Leod and Pasteur

d) None of the above

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72.The tricarboxylic acid formed in the first step of Krebs cycle is

a) fumaric acid

b) oxaloacetic acid

c) citric acid

d) malic acid

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73. The mitochondrion is a

a) double membraned organelle

b) single membraned organelle

c) membraneless organelle

d) none of the above

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74. Oxidation of one molecule of $FADH_2$ yields

a) 1 ATP molecule

b) 2 ATP molecules

c) 3 ATP molecules

d) 4 ATP molecules

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75. The oxidation of one molecule of NADH yields

a) 38 ATP
b) 36 ATP
c) 3 ATP
d) 2 ATP

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Thank You

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