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1. Incomplete oxidation of glucose into pyruvic acid with several intermediate steps is known as

(a) TCA-pathway

(b) glycolysis

(c) HMS-pathway

(d) Krebs cycle.:

Answer and Explanation:

1. (b): Glycolysis is the biochemical change in which one molecule of glucose is converted into 2 molecules of pyruvic acid with the involvement of ten enzymes. It is independent of oxygen and is common to both aerobic and anaerobic condition. It takes place in cytoplasm and all the reactions are reversible.

All the intermediates of glycolysis are not converted into pyruvic acid. Some of them build back the carbohydrates and the phenomenon is called as oxidative anabolism. TCA cycle and Krebs cycle are synonym where the pyruvic acid of glycolysis is utilized to form CO_2. HMS is hexose monophosphate shunt or pentose phospate pathway which is an alternative pathway of glycolysis.

2. $NADP^+$ is reduced to NADPH is

(a) HMP

(b) Calvin Cycle

(c) Glycolysis

(d) EMP. (1988)

Answer and Explanation:

2. (a): HMP pathway generates NADPH molecule which are used as reductants in biosynthetic process under conditions when NADPH molecules are not generated by photosynthesis. It is, therefore, important in non- photosynthetic tissues such as in differentiating tissues, generating seeds and during periods of darkness. Production of NADPH is not linked to ATP generation in pentose phosphate pathway.

3. R.Q. is

(a) C/N

(b) N/C

(c) CO_2/O_2

(d) O_2/CO_2.

Answer:

(c) CO_2/O_2

4. End product of glycolysis is

(a) acetyl CoA

(b) pyruvic acid

(c) glucose I-phosphate

(d) fructose I-phosphate.

Answer and Explanation:

4. (b): In glycolytic cycle, each molecule of glucose (a hexose sugar) is broken down in step wise biochemical reactions under enzymatic control into two molecules of pyruvic acids. It takes place is cytosol.

5. R.Q- is ratio of

(a) CO_2 produced to substrate consumed

(b) CO_2 produced to O_2 consumed

(c) oxygen consumed to water produced

(d) oxygen consumed to CO_2 produced.

Answer:

(b) CO_2 produced to O_2 consumed

6. EMP can produce a total of

(a) 6 ATP

(b) 8 ATP

(c) 24 ATP

(d) 38 ATP.

Answer and Explanation:

6. (b): Glycolysis is also known as EMP pathway after the names of its discoverers. Embden, Meyerhof and Paranas. In glycolysis, 8ATP are produced. 4ATP are formed from substrate level phosphorylation, out of which 2ATP are used up and net gain of 2 AT P. 6ATP are produced from oxidative phosphorylation. Hence, Total ATP produced in glycolysis is 8ATP.

7. Connecting link between glycolysis and Krebs cycle before pyruvate entering Krebs cycle is changed to

(a) oxaloacetate

(b) PEP

(c) pyruvate

(d) acetyl CoA.

Answer and Explanation:

7. (d): End product of glycolysis is pyruvic acid which is converted into acetyl coA before entering into the Krebs cycle, which is aerobic in nature.

8. Terminal cytochrome of respiratory chain which donates electrons to oxygen is

(a) Cyt. b

(b) Cyt. c

(c) Cyt. A_1

(d) Cyt. a_3.

Answer and Explanation:

8. (d): Cytochrome a_3 helps in transfer of electron to oxygen. The oxygen has great affinity to accept the electrons and in presence of protons a water molecule is formed (figure).

9. Out of 36 ATP molecules produced per glucose molecule during respiration

(a) 2 are produced outside glycolysis and 34 during respiratory chain

(b) 2 are produced outside mitochondria and 34 inside mitochondria

(c) 2 during glycolysis and 34 during Krebs cycle

(d) All are formed inside mitochondria.

Answer and Explanation:

9. (b): During respiration, 36 ATP molecules are produced per glucose molecule. 2 molecules of ATP are produced outside mitochondria i.e. during glycolysis and other 34 molecules of ATP are produced inside mitochondria from Krebs cycle.

10. Link between glycolysis, Krebs cycle and P-oxidation of fatty acid or carbohydrate and fat metabolism is

(a) oxaloacetic acid

(b) succinic acid

(c) citric acid

(d) acetyl CoA.

Answer and Explanation:

10. (d): Krebs cycle is intimately related with fat metabolism. Dihydroxy acetone phosphate produced in glycolysis may be 'converted into glycerol via glycerol – 3 – phosphate and vice-versa. Glycerol is important constituents of fats. After P-oxidation, fatty acids give rise to active – 2 – C units, the acetyl-CoA which may enter the Krebs cycle. Thus, Acetyl-CoA is a link between glycolysis, Krebs cycle and P-oxidation of fatty acid or carbohydrate and fat metabolism.