DPP
DAILY PRACTICE PROBLEMS

Class : XIth
Date :

Solutions

Subject : BIOLOGY
DPP No. : 2

Topic :- Respiration in Plants

1 **(a)**
Oxaloacetic acid – 4C. Phosphoglyceric acid – 3C
Ribulose bisphosphite – 3C. Phosphoenl pyruvate – 3C

2 **(b)**
In the non-competitive inhibition of enzymes, the inhibitor (cyanide) has no structural similarity with the substrate (cytochrome-c) and binds to the enzyme at a point other than its active site which leads to change in globular structure of enzyme. Hence, even if the substrate is able to bind with the enzyme, catalysis will not take place.

3 **(a)**
During anaerobic respiration, one molecule of glucose gives two molecules of ATP. Thus, 8 molecules of ATP are produced.

4 **(b)**
Peter Mitchell (1961) proposed the chemiosmotic mechanism of ATP synthesis which, states that ATP synthesis occurs due to H^+ flow through a membrane. It includes development of proton gradient and proton flow.

5 **(d)**
In the process of glycolysis, 6-carbon molecules of glucose are split into two 3-carbon molecules of pyruvic acid. In this, two molecules of NAD^+ are reduced for each glucose molecule. The energy stored within the NADH is released in the electron transport chain.

6 **(a)**
Citric acid cycle is also known as Tricarboxylic acid cycle (TCA)

7 **(d)**
In respiration, whether it is aerobic or anaerobic glucose undergoes oxidation to form energy. In plants glucose is derived from sucrose which is the end product of photosynthesis or from storage carbohydrate. Sucrose is converted into glucose and fructose by the enzyme invertase to enter into the first step of respiration which is glycolytic pathway

8 **(a)**
Fat breakdown into fatty acid and glycerol before entering into the respiratory pathway

9 **(d)**
In glycolysis, water molecule is removed during conversion of 2-phosphoglycerate to phosphoenol pyruvate.
Conversion of fructose-6-phosphate to fructose 1-6 biphosphate is characterized by phosphorylation.

10 **(b)**

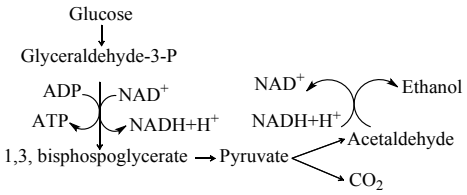
Pentose Phosphate Pathway (or Warburg-Lippman Dickens cycle) is an alternate method of aerobic respiration, which occurs in the cytoplasm of mature cell. This pathway accounts for 60% of total respiration in liver cells. In this, for every six molecules of glucose, one molecule is completely oxidized in CO_2 and reduced coenzymes, while 5 are regenerated.

11 **(a)**

In the first reaction of citric acid cycle one molecule of acetyl Co-A combines with 4-carbon Oxalo Acetic Acid (OAA) to form 6 carbon citric acid and Co-A is released

12 **(a)**

During fermentation, the pyruvic acid releases one molecule of CO_2 to produce acetaldehyde. The acetaldehyde, then reoxidises NADH and is itself reduced to ethanol. These reactions are catalysed by the enzyme, pyruvic acid decarboxylase and alcohol dehydrogenase



13 **(b)**

In the Krebs' cycle, when Succinic acid undergoes oxidation or dehydrogenation to form Fumaric acid, two hydrogens are transferred to FAD. FAD is reduced to FADH and enzyme involved in this step is Succinic acid dehydrogenase.

14 **(d)**

Respiratory pathway involved in both anabolism and catabolism, hence it is regarded as amphibolic pathway. In respiratory pathway not only the glucose but also amino acid and fatty acid can be used as intermediatory substances

15 **(c)**

The RQ value of 4 may be expected from complete oxidation of oxalic acid.

16 **(d)**

Fatty acid, protein and earbohydrak would be broken down to acetyl Co-A before entering the respiratory pathway when it is used as a substrate

17 **(a)**

Anaerobic arespiration occurs without O_2 which convince that it happens in lower organism

18 **(d)**

During the step of Krebs' cycle, where Succinic acid undergoes oxidation or dehydrogenation to form Fumaric acid, FAD is reduced to $FADH_2$ and enzyme involved in this step is Succinic acid dehydrogenase.

Conversion of isocitric acid to α-ketoglutaric acid, malic acid to oxaloacetic acid and pyruvic acid to acetyl Co-A, all involve reduction of NAD to $NADH+H^+$

19 **(a)**

One molecule of pyruvic acid converted in acetyl Co-A for 3 molecule of $NADH + H^+$

20 **(b)**

In 1950, **Kolliker** for the first time seen mitochondria. Later on **C Benda** coined the term mitochondria. These are the sites of cellular respiration, oxidative phosphorylation, synthesis of haeme protein, cytochrome, myoglobin, etc.

ANSWER-KEY										
Q.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
A.	**A**	**B**	**A**	**B**	**D**	**A**	**D**	**A**	**D**	**B**
Q.	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
A.	**A**	**A**	**B**	**D**	**C**	**D**	**A**	**D**	**A**	**B**