

Topic :- Respiration in Plants

- (c)**
The energy released by oxidation in respiration is not directly used but it stored as ATP. Which is broken down whenever energy needs to be utilised
- (c)**
RQ is one in case of **carbohydrates**, while for fatty acids is less than one and for organic acids RQ is more than one.
- (a)**
Sucrose or cane sugar is widely distributed among higher plants. Its commercial sources are solely sugarcane and beet. It is used as substrate for the formation of alcohol.
- (b)**
The correct sequence in glycolysis is
Glucose-6-phosphate → 3-phosphoglyceraldehyde
Phosphoenol → 3-phosphoglyceric acid ↓
Pyruvate
↓
Pyruvic acid.
- (a)**
Cyanide is a deadly poison of respiration and inhibit the activity of cytochrome-c oxidase complex (which contains cytochrome-a and cytochrome-a₃) of electron transport chain of aerobic respiration. Thus, no proton gradient will be established and no ATP will be formed. Along with as the reduction of NADH and FADH₂ is also ceased due to blockage of ETS, the availability of hydrogen acceptors like NAD⁺ and FAD is ceased for Krebs' cycle and glycolysis. Cyanide resistance pathway is anaerobic respiration.
- (a)**
Hexokinase causes phosphorylation of glucose to glucose-6 phosphate in both glycolysis and pentose phosphate pathway. Both glycolysis and phosphate pathway occur in cytoplasm. Glucose + ATP
 $\xrightarrow{\text{Hexokinase}}$ Glucose 6-phosphate + ADP
- (b)**
The aerobic respiration takes place within the mitochondria, the final product of glycolysis pyruvate is transported from the cytoplasm into the mitochondria. *The major events in aerobic respiration are*
The complete oxidation of pyruvate by the stepwise removal of all the hydrogen atoms, leaving 3 molecules of CO₂.
The passing on of the electrons removed as part of the hydrogen atoms to molecular O₂ with

simultaneous synthesis of ATP

8 **(b)**

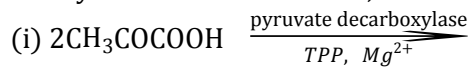
Glycolysis is an essential and first path of respiration. It is common in both aerobic and anaerobic respiration and occurs in the cytosol of all living cells of prokaryotes as well as eukaryotes

9 **(d)**

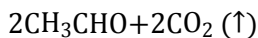
Oxidative phosphorylation or ATP synthesis from NADH occur only under aerobic condition.

10 **(d)**

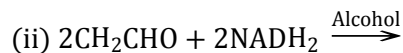
In ethyl alcohol fermentation,



Pyruvic acid



Acetaldehyde



Acetaldehyde



Ethyl alcohol

11 **(c)**

The activity of succinate dehydrogenase is inhibited by Malonate.

12 **(a)**

Citric acid is produced by the fermentation of sugar by *Aspergillus niger*, *Mucor* sp and yeast.

13 **(a)**

In the process of respiration the compound, *i.e.*, glucose reacts with oxygen which is called oxidation therefore organic substance gets oxidised

14 **(b)**

Pyruvate is broken down to CO_2 and H_2O in citric acid or tricarboxylic acid cycle (TCA)

15 **(a)**

Preparatory phase before fermentation is called **upstream processing** while downstream processing is the name given to the stage after fermentation, when the desired product is recovered and purified.

16 **(d)**

Retting is facilitated by anaerobic butyric acid bacteria such as *Clostridium botulinum*, *Clostridium tetani* and *Clostridium perfringens*.

17 **(b)**

RQ is the ration of the volume of carbon dioxide released to the volume of oxygen taken in respiration. It depends on the nature of the substrate, which is oxidised. For carbohydrates RQ is one, for fats and proteins less than one but more than one for organic acids, etc.

18 **(d)**

The complex V of ETS of mitochondrial membrane is ATP synthase, which has a head piece, stalk and a base piece. Out of these, the head piece is identified as the coupling factor 1(F_1), stalk portion is

necessary for binding *i* to inner mitochondrial membrane and base piece is isolated as F_0 and present within the inner mitochondrial membrane.

19 **(a)**

Protein breaks down into amino acid then enter into the glycolytic pathway

20 **(d)**

Ethyl alcohol is commercially manufactured from sugarcane. Molasses is the byproduct of sugar industry. Ethanol is produced by the fermentation of molasses (contains glucose and fructose) by using yeast, *Saccharomyces cerevisiae*.

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

PE