

Topic :- Respiration in Plants

- 1 **(b)**
Respiratory quotient = $\frac{\text{Evolved CO}_2}{\text{Consumed O}_2}$
Hence, how much O₂ will consume. It all depends substrate
- 2 **(b)**
In anaerobic respiration, *i.e.*, absence of O₂, glycolysis and fermentation involves. In fermentation incomplete oxidation of glucose is processed by sets of reaction where pyruvic acid is converted to C O₂ and ethanol
- 3 **(a)**
It is well known fact that photosynthesis in eukaryotes occurs in chloroplast whereas in prokaryotes it is in cytoplasm
- 4 **(c)**
Anaerobic respiration occurs in absence of oxygen. It is found in deep-seated tissues of plants and animals, germinating seeds, yeasts and bacteria. During anaerobic respiration of yeast, two ATP produced from each glucose molecule. Hence, 38 ATP will produce from 19 glucose molecules.
- 5 **(b)**
In aerobic respiration, glycolysis is linked with Krebs' cycle through acetyl Co-A because pyruvic acid (end-product of glycolysis) first converted into acetyl Co-A. The acetyl Co-A enters in the Krebs' cycle. The formation of acetyl Co-A is involved with some cofactors like Mg ions, thiamine pyrophosphate (Vitamin-B₁), NAD⁺, Co-A and lipoic acid.
- 6 **(d)**
In anaerobic respiration CO₂ is evolved but oxygen is not used. Therefore in such case respiratory quotient will be infinite. *e.g.*,
$$\text{C}_6\text{H}_{12}\text{O}_6 \xrightarrow{\text{Zymase}} 2 \text{C}_2\text{H}_5\text{OH} + 2 \text{CO}_2 + \text{Energy}$$

Glucose
Where, respiratory quotient = $\frac{\text{Evolved CO}_2}{\text{Consumed O}_2}$
$$= \frac{2 \text{CO}_2}{0 \text{O}_2} = \infty(\text{Infinity})$$
- 7 **(c)**
The NADH synthesised in glycolysis is transferred into the mitochondria and undergoes oxidative phosphorylation
- 8 **(b)**
Total gain of 38 ATP molecules during aerobic respiration of one molecule of glucose

- 9 **(a)**
During glycolysis, in the presence of enzyme Hexokinase, glucose is converted into glucose-6-phosphate by using one ATP molecule in presence of Mg^{2+}
- 10 **(b)**
In the presence of Zymase, alcoholic fermentation takes place.
- 11 **(c)**
During the conversion of Succinyl Co-A to Succinic acid, a molecule of GTP is synthesized. This is a substrate level phosphorylation. In a coupled reaction, GTP is converted to GDP with the simultaneous synthesis of ATP from ADP.
- 12 **(b)**
Pyruvic acid is 3C-compound. One of the three carbon atoms of pyruvic acid is oxidised to carbon dioxide in a reaction called oxidative decarboxylation. Pyruvate is first decarboxylated and then oxidised by the enzyme pyruvate dehydrogenase. The combination of the remaining 2-carbon acetate unit is readily accepted by a sulphur containing compound, coenzyme A (Co-A) to form acetyl Co-A
- 4 **(c)**
Generally lower organism, *e.g.*, bacteria and fungi performs anaerobic respiration but also occur in higher organism
- 15 **(b)**
Pathway - A is glycolysis $\rightarrow 2 \text{ NADH} + \text{H}^-$
Pathway - B is Krebs's cycle $\rightarrow 6 \text{ NADH} + \text{H}^+$
Pathway - C is Electron transport system
Between pathway A and pathway B $\rightarrow 2 \text{ NADH} + \text{H}^+$ produced
- 16 **(a)**
In electron transport chain respiratory process are to release and utilise the energy stored in $\text{NADH} + \text{H}^+$ and FADH_2 . This is accomplished when they are oxidised through the electron transport system and the electron are passed on to O_2 resulting in the formation of H_2O
- 17 **(b)**
During citric acid cycle, 3 molecules of NAD^+ and one molecule of FAD (Flavin Adenine Dinucleotide) are reduced to produce NADH and FADH_2 respectively. These reduced electron carriers pass on the hydrogen atoms to oxygen through electron transport system, yielding 11 more ATP molecules for each molecule of pyruvic acid.
In addition one ATP molecules is generated directly during the cycle to give a total of 12 ATP molecule per pyruvic acid molecules. As two molecules of pyruvic acid are produced from each molecule of glucose a total of 24 molecules of ATP are formed during the citric acid cycle
- 18 **(d)**
When the fats respire, the value of RQ is less than one.
- 19 **(d)**
Glycolysis involves ten step for each step, specific enzyme needs to go next step
- 20 **(d)**
ATP is a coenzyme. Coenzyme is an organic cofactor molecule smaller than protein that bonds with a specific enzyme, while the reaction is being catalysed.

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

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