

Respiration in Plants

- Assertion (A):** During oxidation of respiratory substrate energy does not release in a single step.

Reason (R): Breakdown of respiratory substrate in single step leads to unfavourable changes in cell temperature.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false
- Assertion (A):** For plant respiration there is no need of specialized respiratory organs.

Reason (R): Plants donot show great demands for gaseous exchange.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false
- Assertion (A):** Glycolysis is the oxidative process, while there is not utilization of O_2 .

Reason (R): In glycolysis two redox equivalents are removed in form of two hydrogen atoms.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false
- Assertion (A):** For complete breakdown of respiratory substrate Krebs cycle is essential.

Reason (R): Krebs cycle is associated with step wise removal of all the hydrogen and CO_2 molecules.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false
- Assertion (A):** In Natural alcoholic drinks (beverages) alcohol level can never be exceed more than 13%.

Reason (R): Beyond 13% alcohol concentration yeast poison themselves to death.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false
- Assertion (A):** Removal of all hydrogen atoms from pyruvic acid is the crucial event in aerobic respiration.

Reason (R): These removed hydrogens are actually the source of energy for ATP synthesis.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false
- Assertion (A):** Ubiquinone is one of the important carrier of respiratory ETS.

Reason (R): Ubiquinone helps in oxidation of both $NADH_2$ and $FADH_2$.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false
- Assertion (A):** Oxygen is vital for aerobic respiration.

Reason (R): Oxygen drives whole process by removing hydrogen from the system.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false



9. **Assertion (A):** In ETS of respiration, oxidation of one carrier and reduction of another carrier is essential.
Reason (R): In respiratory ETS, energy of oxidation reduction utilized for production of proton gradient.
 (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 (3) (A) is true but (R) is false
 (4) Both (A) and (R) are false
10. **Assertion (A):** The passage of protons through complex-V is coupled to production of ATP.
Reason (R): Passage of protons through complex-V is associated with breakdown of proton gradient which leads to release of energy for joining of ADP & Pi.
 (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 (3) (A) is true but (R) is false
 (4) Both (A) and (R) are false
11. **Assertion (A):** Calculation of the net gain of ATP for every glucose molecule oxidized is practically possible.
Reason (R): All the pathway work one after another and do not take place simultaneously.
 (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 (3) (A) is true but (R) is false
 (4) Both (A) and (R) are false
12. **Assertion (A):** During fermentation oxidation of NADH to NAD⁺ is comparatively slow process than aerobic respiration.
Reason (R): NADH arise during fermentation do not enter in ETC, it is to reduce the pyruvate or aldehyde.
 (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 (3) (A) is true but (R) is false
 (4) Both (A) and (R) are false

13. **Assertion (A):** Respiratory path is an amphibolic pathway rather than as a catabolic one.
Reason (R): Respiratory pathway is involved in both anabolism and catabolism.
 (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 (3) (A) is true but (R) is false
 (4) Both (A) and (R) are false
14. **Assertion (A):** It is better to consider the respiratory pathway as an amphibolic pathway rather than only as a catabolic one.
Reason (R): Breaking down processes within the living organism is catabolism, and synthesis is anabolism.
 (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 (3) (A) is true but (R) is false
 (4) Both (A) and (R) are false
15. **Assertion (A):** When carbohydrates are used as respiratory substrate and are completely oxidised, the RQ will be 1.
Reason (R): Equal amounts of CO₂ and O₂ are evolved and consumed, when carbohydrates are used as respiratory substrate and are completely oxidised.
 (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 (3) (A) is true but (R) is false
 (4) Both (A) and (R) are false
16. **Assertion (A):** During oxidation within a cell, all the energy contained in into the cell, in a single step.
Reason (R): The energy released by oxidation in respiration is not (or rather cannot be) used directly but is used to synthesise ATP.
 (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 (3) (A) is true but (R) is false
 (4) Both (A) and (R) are false

17. **Assertion (A):** When carbohydrates are used as substrate and are completely oxidised, the RQ will be 1.

Reason (R): The respiratory quotient depends upon the type of respiratory substrate used during respiration.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

18. **Assertion (A):** Water molecules appear on both sides of the equation of photosynthesis.

Reason (R): The molecules that enter the reaction are not the same molecules that emerge from the reaction.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

Directions: In the following questions, a statement of assertion is followed by a statement of reason.

Mark the correct choice as:

- (a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- (b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- (c) If Assertion is true but Reason is false.
- (d) If both Assertion and Reason are false.

19. **Assertion :** Glycolysis is the first step of respiration in which glucose completely breaks into CO_2 and H_2O .
Reason : In this process, there is net gain of twenty four molecules of ATP.
20. **Assertion:** Substrate level phosphorylation is present in glycolysis.
Reason : Substrate level phosphorylation causes synthesis of ATP.
21. **Assertion:** Fructose-1, 6 diphosphate is converted into glyceraldehyde-3-phosphate and dihydroxy-acetone-3-phosphate.
Reason: In the presence of enzyme aldolase, conversion of fructose-1, 6 diphosphate into 3-phosphoglyceraldehyde and dihydroxyacetone-3-phosphate is facilitated.
22. **Assertion:** Plants do not have specialised respiratory organs.
Reason: There is very little transport of gases from one plant part to another.
23. **Assertion:** The process of glycolysis is also known as EMP pathway.
Reason: It is the only process of respiration in aerobic organisms.
24. **Assertion:** During strenuous exercise, anaerobic respiration sometimes occurs in our skeletal muscles.
Reason: Pyruvic acid is reduced to lactic acid in the presence of lactate

dehydrogenase and in the absence of oxygen.

25. **Assertion:** In alcoholic fermentation, the hexose molecule is converted into glucose and fructose.
Reason : Alcoholic fermentation is anaerobic respiration brought about by enzyme zymase.
26. **Assertion:** The breaking of the C- C bonds of complex compound through oxidation within the cells and release of large amount of energy is respiration.
Reason: During respiration, the compounds that are oxidised are called respiratory substrates.
27. **Assertion :** The product of the first reaction of the Kreb's cycle is citric acid, a six carbon compound.
Reason : The first reaction of the Kreb's cycle is the condensation of acetyl CoA with oxaloacetate.
28. **Assertion:** The inner membrane of mitochondria contains systems involving electron transport.
Reason : The mitochondrial matrix contains enzymes of Kreb's cycle.
29. **Assertion :** F_1 particles are present in the inner mitochondrial membrane.
Reason : An electron gradient formed on the inner mitochondrial membrane, forms ATP.
30. **Assertion:** The RQ is equal to 1, when carbohydrates are used as substrate and are completely oxidised.
Reason: in respiration, the RQ is greater than 1



ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Ans.	1	1	1	1	1	1	1	1	1	1	4	1	1	2	1	4	2	2

19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.							
d	b	b	a	c	a	a	b	a	b	c	c							