CLASS XI BIO CH - 12

Set 3 – Respiration in Plants (Conceptual / NEET-style)

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1. When oxygen is not available, pyruvic acid is converted into —
A) Acetyl CoA B) Ethanol or Lactic acid C) CO_2 D) Oxaloacetate

2. The main reason for anaerobic respiration in waterlogged plant roots is —
A) Lack of oxygen B) Lack of glucose C) High CO_2 concentration D) Low temperature

3. The process common to both aerobic and anaerobic respiration is —
A) Glycolysis B) TCA cycle C) ETS D) Oxidative phosphorylation

4. The number of ATP molecules formed in glycolysis under anaerobic conditions is —
A) 36 B) 38 C) 2 D) 4

5. Pyruvate formed during glycolysis enters mitochondria only when —
A) O_2 is present B) CO_2 is present C) H_2O is available D) Glucose is abundant

6. Which of the following occurs in both photosynthesis and respiration?
A) Oxygen evolution B) Electron transport chain C) Fixation of CO_2 D) Formation of glucose

7. The TCA cycle does not operate under anaerobic conditions because —
A) NAD^+ is not regenerated B) ATP is not available C) Pyruvate is not formed D) O_2 is not required

8. In oxidative phosphorylation, energy for ATP synthesis comes from —
A) Electron transport B) Substrate oxidation C) Photons of light D) Hydrogen ions

9. The immediate energy currency in cells is —
A) ATP B) NADH C) $FADH_2$ D) Glucose

10. Which process is responsible for the release of maximum energy during respiration?
A) Glycolysis B) Fermentation C) Krebs cycle D) ETS

11. Chemiosmotic hypothesis explains —
A) CO_2 fixation B) ATP synthesis C) O_2 liberation D) NADH oxidation

12. Proton gradient is established during —
A) Glycolysis B) Krebs cycle C) Electron transport chain D) Fermentation

13. The energy yield from oxidation of one NADH molecule is —
A) 2 ATP B) 3 ATP C) 1 ATP D) 4 ATP

14. In aerobic respiration, the final electron acceptor is —
A) NAD^+ B) FAD C) O_2 D) CO_2

15. The process that produces both ATP and NADH is —
A) Glycolysis B) Fermentation C) Krebs cycle D) ETS

16. How many ATP molecules are formed by complete oxidation of one molecule of glucose?
A) 2 B) 36–38 C) 24 D) 12

17. The link reaction connects —
A) Glycolysis and TCA cycle B) Krebs cycle and ETS C) Glycolysis and fermentation D) Photosynthesis and respiration

18. Substrate-level phosphorylation occurs in —
A) Glycolysis and Krebs cycle B) ETS only C) Fermentation only D) Photosynthesis

19. Which of the following reactions is irreversible in glycolysis?
A) Glucose → Glucose-6-phosphate B) 3-phosphoglycerate → 2-phosphoglycerate C) Fructose-6-phosphate → Fructose-1,6-bisphosphate D) Both A and C

20. In yeast, anaerobic respiration produces —
A) Ethanol B) Lactic acid C) Acetaldehyde D) CO_2 only

21. RQ value greater than 1 indicates —
A) Breakdown of carbohydrates B) Breakdown of organic acids C) Breakdown of fats D) Breakdown of proteins

22. Which of the following processes is not found in mitochondria?
A) Krebs cycle B) ETS C) Glycolysis D) Oxidative phosphorylation

23. During conversion of succinate to fumarate, the hydrogen acceptor is —
A) NAD^+ B) FAD C) FMN D) Ubiquinone

24. The number of NADH molecules produced during oxidation of one glucose molecule in glycolysis and TCA cycle combined is —
A) 4 B) 8 C) 10 D) 12

25. How many molecules of CO_2 are evolved during complete oxidation of one molecule of glucose?
A) 2 B) 4 C) 6 D) 8

26. The conversion of pyruvate to acetyl-CoA produces —
A) CO_2 and NADH B) CO_2 and ATP C) $FADH_2$ D) Lactic acid

27. The total gain of ATP from one NADH molecule during aerobic respiration is —
A) 2 ATP B) 3 ATP C) 4 ATP D) 5 ATP

28. In alcoholic fermentation, NADH formed in glycolysis is —
A) Oxidised to NAD^+ B) Reduced to NAD^+ C) Converted to ATP D) Broken down

29. Which one is the most energy-efficient pathway of respiration?
A) Aerobic respiration B) Anaerobic respiration C) Fermentation D) Photorespiration

30. In plants, the gaseous exchange occurs mainly through —
A) Stomata and lenticels B) Cuticle C) Root hairs D) Epidermis

31. The substrate for respiration in germinating fatty seeds is —
A) Glucose B) Fatty acids C) Amino acids D) Organic acids

32. During respiration, oxidative phosphorylation takes place at —
A) Inner mitochondrial membrane B) Outer mitochondrial membrane C) Mitochondrial matrix D) Cytoplasm

33. The flow of electrons through ETS causes —
A) Proton gradient formation B) Oxygen evolution C) CO_2 fixation D) ATP breakdown

34. In which of the following steps is CO_2 released?
A) Pyruvate → Acetyl CoA B) Isocitrate → α-ketoglutarate C) α-ketoglutarate → Succinyl CoA D) All of these

35. The enzyme that catalyses the conversion of pyruvate to acetyl-CoA is —
A) Pyruvate dehydrogenase B) Pyruvate decarboxylase C) Alcohol dehydrogenase D) Lactate dehydrogenase

36. Which of the following is not formed in anaerobic respiration?
A) CO_2 B) NADH C) ATP D) Water

37. In electron transport chain, electrons are finally transferred to —
A) Oxygen B) Carbon dioxide C) Hydrogen D) ATP

38. In Krebs cycle, which compound is both oxidised and reduced?
A) Fumarate B) Succinate C) Malate D) α-Ketoglutarate

39. In aerobic respiration, oxygen acts as —
A) Final hydrogen acceptor B) CO_2 donor C) Electron donor D) Oxidising substrate

40. Which of the following is produced in both respiration and photosynthesis?
A) ATP B) CO_2 C) O_2 D) NADPH

41. Which of the following is true for fermentation?
A) It occurs in absence of oxygen B) It yields only 2 ATP C) It produces ethanol or lactic acid D) All of these

42. The ATP yield in aerobic respiration is higher than anaerobic because —
A) Oxygen acts as terminal acceptor B) More NADH is produced C) Krebs cycle operates D) All of these

43. The number of oxygen molecules required to completely oxidise one glucose molecule is —
A) 2 B) 3 C) 4 D) 6

44. How many NADH molecules are formed during the oxidation of one pyruvate molecule to CO_2 and H_2O?
A) 3 B) 4 C) 5 D) 6

45. If respiration takes place without using oxygen, it is called —
A) Anaerobic respiration B) Fermentation C) Both A and B D) Photorespiration

46. ATP generation through transfer of phosphate from a substrate is —
A) Substrate level phosphorylation B) Oxidative phosphorylation C) Chemiosmosis D) Phosphorylation

47. The ATP synthase complex is active only when —
A) Proton gradient is established B) Oxygen is available C) NADH is present D) Cytochrome oxidase is inhibited

48. The oxidation of one molecule of $FADH_2$ yields —
A) 2 ATP B) 3 ATP C) 4 ATP D) 1 ATP

49. The respiratory substrate in plants can be —
A) Carbohydrates B) Fats C) Proteins D) All of these

50. The most suitable measure of efficiency of respiration is —
A) RQ B) ATP yield C) CO_2 evolution D) Oxygen absorption

✅ Answer Key (Set 3)

1-B, 2-A, 3-A, 4-C, 5-A, 6-B, 7-A, 8-A, 9-A, 10-D,
11-B, 12-C, 13-B, 14-C, 15-A, 16-B, 17-A, 18-A, 19-D, 20-A,
21-B, 22-C, 23-B, 24-C, 25-C, 26-A, 27-B, 28-A, 29-A, 30-A,
31-B, 32-A, 33-A, 34-D, 35-A, 36-D, 37-A, 38-C, 39-A, 40-A,
41-D, 42-D, 43-D, 44-B, 45-C, 46-A, 47-A, 48-A, 49-D, 50-B.