

## Respiration in Plants-Test paper

**1. How many ATP molecules could maximally be generated from one molecule of glucose, if the complete oxidation of one mole of glucose to CO<sub>2</sub> and H<sub>2</sub>O yields 686 kcal and the useful chemical energy available in the high energy phosphate bond of one mole of ATP is 12 kcal?**

- a) 1                      b) 2                      c) 30                      d) 57

**2. All enzymes of TCA cycle are located in the mitochondrial matrix except one which is located in inner mitochondrial membranes in eukaryotes and in cytosol in prokaryotes this enzyme is**

- a) isocitrate dehydrogenase    b) malate dehydrogenase    c) succinate dehydrogenase    d) lactate dehydrogenase

**3. The overall goal of glycolysis Krebs' cycle and the electrons transport system is the formation of**

- a) ATP in one large oxidation reaction    b) sugars    c) nucleic acids    d) ATP in small stepwise units

**4. The energy-releasing process in which the substrate is oxidised without an external electron acceptor is called**

- a) aerobic respiration    b) glycolysis    c) fermentation    d) photorespiration

**5. The chemiosmotic coupling hypothesis of oxidative phosphorylation proposes that adenosine triphosphate (ATP) is formed because**

- a) a proton gradient forms across the inner membrane    b) there is a change in the permeability of the inner mitochondrial membrane towards adenosine diphosphate (ADP)  
c) high energy bonds are formed in mitochondrial proteins  
d) ADP is pumped out of the matrix into the intermembrane space

**6. Aerobic respiratory pathway is appropriately termed**

- a) parabolic    b) amphibolic    c) anabolic    d) catabolic

**7. In mitochondria, protons accumulate in the**

- a) outer membrane    b) inner membrane    c) intermembrane space    d) matrix

**8. Which of the metabolites is common to respiration-mediated breakdown of fats, carbohydrates and proteins?**

- a) Pyruvic acid    b) Acetyl CoA    c) Glucose-6-phosphate    d) Fructose 1, 6 - bisphosphate

**9. In which one of the following processes CO<sub>2</sub> is not released?**

- a) Aerobic respiration in plants    b) Aerobic respiration in animals  
c) Alcoholic fermentation    d) lactate fermentation

**10. Cytochromes are found in**

- a) cristate of mitochondria    b) lysosomes    c) matrix of mitochondria    d) outer wall of mitochondria

**11. In the TCA cycle, the acid to react with acetyl co-enzyme A is**

- a) oxaloacetic acid    b) fumaric acid    c) malic acid    d) succinic acid

**12. The rate of transpiration would be maximum when**

- a) both soil and air are dry    b) soil is dry and air is humid  
c) soil is wet and air is humid    d) soil is wet and air is dry

**13. An organism which could readily respire in absence of molecular oxygen could be a**

- a) fish    b) Mushroom    c) *Anabaena*    d) *Saccharomyces*

**14. The net gain of ATP in anaerobic respiration is**

- a) 2    b) 4    c) 36    d) 32

**15. Citric acid cycle is also called**

- a) Krebs' cycle    b) TCA cycle    c) tricarboxylic acid cycle    d) all of these

**16. Glycolysis leads to the formation of 2 molecules of**

- a) oxaloacetic acid    b) pyruvic acid    c) citric acid    d) acetic acid

**17. The enzyme decarboxylase catalyses**

- a) conversion of citric acid to *cis* aconitic acid    b) fumaric acid to malic acid  
c) oxalosuccinic acid to  $\alpha$ -ketoglutaric acid    d) malic acid to oxaloacetic acid

**18. For glycolysis which of the following is true?**

- a) It is metabolic pathway leading to production of glucose    b) It takes place in cytoplasm  
c) It is oxygen dependent process    d) No ATP is synthesized during this process

**19. In plant cell, glycolysis operates in**

- a) mitochondria    b) peroxisome    c) mesosome    d) cytoplasm

**20. How many molecules of oxygen are used during glycolysis of one glucose molecule?**

- a) 38    b) 34    c) 2    d) 0

**21. Cell respiration is carried out by**

- a) ribosome    b) mitochondria    c) chloroplast    d) Golgi bodies

**22. In aerobic respiration, citric acid cycle takes place in**

- a) cytosol    b) mitochondria    c) peroxisomes    d) endoplasmic reticulum

**23. The radiation energy of light is converted to chemical energy and stored as**

- a) AMP    b) ADP    c) ATP    d) APP

**24. End product of glycolysis is**

- a) oxaloacetic acid    b) Pyruvic acid    c) succinic acid    d) succinyl coenzyme

**25. In glycolysis enzyme playing key role in splitting 6C compound into 3C compound is**

- a) hexokinase    b) aldolase    c) isomerase    d) none of these

**26. HSK pathway is also called as**

- a) C<sub>2</sub> cycle    b) C<sub>3</sub> cycle    c) C<sub>4</sub> cycle    d) none of these

**27. The details of tricarboxylic acid path was worked out by**

- a) Meischer    b) Hans Krebs    c) Pasteur    d) none of these

**28. The number of carbonatom in citric acid is**

- a) 8    b) 6    c) 10    d) 2

**29. Which one of the following options correctly depicts the net energy yield of aerobic respiration in eukaryotic cells?**

- a) 30 ATP    b) 36 ATP    c) 38 ATP    d) 36 ATP and 38 ATP

**30. The respiratory enzymes in the aerobic bacteria are located mainly in**

- a) chondrioids    b) mitochondria    c) polysomes    d) phagosomes

**31. Final electron acceptor in ETS is**

- a) H<sub>2</sub>O    b) O<sub>2</sub>    c) cyt a<sub>3</sub>    d) cyt a

**32. Yeast converts glucose to**

- a) N<sub>2</sub> H<sub>5</sub>OH and H<sub>2</sub>O    b) O<sub>2</sub>H<sub>5</sub>OH and CO<sub>2</sub>    c) pyruvic acid and CO<sub>2</sub>    d) lactic acid and CO<sub>2</sub>

**33. Which of the following forms the connecting link between glycolysis and Kreb's cycle?**

- a) Glucose    b) Ethyl alcohol    c) Lactic acid    d) Acetyl CoA

**34. The number of glucose molecules required to produce 38 ATP molecules under anaerobic conditions by a yeast cell is**

- a) 2    b) 4    c) 19    d) 25

**35. Which of the following does not function as an electron carrier?**

- a) oxygen    b) Cytochrome-c    c) Cytochrome -a    d) Ubiquinone

**36. The intermediate compound common for aerobic and anaerobic respiration in**

- a) citric acid    b) pyruvic acid    c) acetyl coA    d) succinic acid

**37. The process used in conversion of pyruvic to acetyl coA is**

- a) oxidative dehydration    b) oxidative decarboxylation  
c) oxidative phosphorylation    d) oxidative dehydrogenation

**38. If R.Q. is 0.6 in a respiratory metabolism, it would mean that**

- a) carbohydrates are used as respiratory substrate
- b) organic acids are used as respiratory substrate
- c) the oxidation of the respiratory substrate consumed more oxygen than the amount of CO<sub>2</sub> released
- d) the oxidation of the respiratory substrate consumed less oxygen than the amount of CO<sub>2</sub> released

**39. Biological oxidation in krebs cycle involves**

- a) O<sub>2</sub>
- b) CO<sub>2</sub>
- c) O<sub>3</sub>
- d) NO<sub>3</sub>

**40. In which of the following reactions of glycolysis oxidation takes place?**

- a) Glucose 6-PO<sub>4</sub> to fructose 6-PO<sub>4</sub>
- b) glyceraldehydes 3-phosphate to 1, 3 - bisphosphoglycerate
- c) 1, 3 – diphosphoglycerate to 3 – phosphoglycerate
- d) 2 – phosphoglycerate to phosphoglycerate

**41. FAD acts as an e- acceptor in between**

- a) fumaric and malic acid
- b) succinic and fumaric acid
- c) malic and oxaloacetic acid
- d) citric and isocitric acid

**42. The overall goal of glycolysis, Krebs cycle and the electron transport system is the formation of**

- a) ATP in small stepwise units
- b) ATP in one large oxidation reaction
- c) Sugars
- d) Nucleic acids

**43. Anaerobic respiration is also called as**

- a) β-oxidation
- b) fermentation
- c) oxidation
- d) None of these

**44. The number of ATP produced when a molecule of glucose undergoes fermentation**

- a) 4
- b) 36
- c) 12
- d) 38

**45. Glycolysis**

- a) takes place in the mitochondria
- b) produces no ATP
- c) has no connection with electron transport chain
- d) reduces two molecules of NAD<sup>+</sup> for every glucose molecule processed

**46. In Krebs' cycle GTP is formed in**

- a) oxidative phosphorylation
- b) substrate level phosphorylation
- c) photophosphorylation
- d) decarboxylation

**47. Common enzyme in glycolysis and pentose phosphate pathway is**

- a) hexokinase
- b) aconitase
- c) fumarase
- d) dehydrogenase

**48. Aerobic respiration pathway is appropriately termed**

- a) catabolic
- b) parabolic
- c) amphibolic
- d) anabolic

**49. A competitive inhibitor of succinic dehydrogenase is**

- a) malonate
- b) oxaloacetate
- c) α –ketoglutarate
- d) malate

**50. Chemiosmotic theory of ATP synthesis in chloroplasts and mitochondria is based on**

- a) proton gradient
- b) accumulation of K<sup>+</sup> ions
- c) accumulation of Na<sup>+</sup> ions
- d) membrane potential

**51. In Glycolysis, electrons are removed by**

- a) ATP
- b) NAD
- c) glyceraldehydes 3-phosphate
- d) molecular oxygen

**52. Dough kept overnight in a warm place becomes soft and spongy due to**

- a) osmosis
- b) absorption of CO<sub>2</sub> from atmosphere
- c) cohesion
- d) fermentation

**53. In alcoholic fermentation**

- a) triose phosphate is the electron donor, while acetaldehyde is the electron acceptor
- b) triose phosphate is the electron donor, while pyruvic acid is the electron acceptor
- c) there is no electron donor
- d) oxygen is the electron acceptor

**54. In which of the do the two names refer to one and the same thing?**

- a) Krebs' cycle and Calvin cycle
- b) Tricarboxylic acid cycle and citric acid cycle
- c) Citric acid cycle and Calvin cycle
- d) Tricarboxylic acid cycle and urea cycle

**55. A scientist added a chemical (cyanide) to an animal cell to stop aerobic respiration. Which of the following is most likely to have been affected by this treatment?**

- a) Active transport of substances across the plasma membrane
- b) Passive transport of substances across the plasma membrane
- c) Diffusion of substances across the plasma membrane
- d) The thickness of the plasma membrane

**56. Krebs' cycle was discovered by Krebs in pigeon muscles in 1940, which step is called gateway step/link reaction/transition reaction in respiration?**

- a) glycolysis
- b) Formation of acetyl coA
- c) Citric acid formation
- d) ETS terminal oxidation

**57. Mechanism of aerobic respiration was discovered by**

- a) Calvin
- b) Krebs
- c) Pasteur
- d) Hatch and Slack

**58. What is the correct order of the stage of cellular respiration?**

- a) Krebs' cycle – Electron transport chain – Glycolysis
- b) Electron transport chain – Krebs' cycle – Glycolysis
- c) Glycolysis – Krebs' cycle – Electron transport chain
- d) Glycolysis–Electron transport chain – Krebs' cycle

**59. In mitochondria, enzyme cytochrome oxidase is present in**

- a) outer membrane
- b) perimitochondrial space
- c) Inner membrane
- d) matrix

**60. Fermentation is**

- a) anaerobic respiration
- b) incomplete oxidation of carbohydrates
- c) complete oxidation of carbohydrates
- d) none of the above

**Answer key: 12 Respiration in plants**

Q no.	Ans	Q no.	Ans	Q no.	Ans	Q no.	Ans	Q no.	Ans	Q no.	Ans
1	d	11	a	21	b	31	b	41	b	51	b
2	c	12	d	22	b	32	b	42	a	52	d
3	d	13	d	23	c	33	d	43	b	53	a
4	c	14	a	24	b	34	c	44	c	54	b
5	a	15	d	25	b	35	a	45	d	55	a
6	b	16	b	26	c	36	b	46	b	56	b
7	c	17	c	27	b	37	b	47	a	57	b
8	b	18	b	28	b	38	c	48	c	58	c
9	d	19	d	29	d	39	b	49	a	59	c
10	a	20	d	30	b	40	b	50	a	60	a&b