

Exercise - I (Conceptual Questions)

Build Up Your Understanding

INTRODUCTION TO AEROBIC RESPIRATION (KREBS CYCLE)

1. Energy obtained by a cell from catabolic reaction is stored immediately in the form of

(1) Pyruvic acid (2) Glucose
(3) ATP (4) DNA

BRP001

2. Number of ATP produced from one pyruvic acid during conversion to acetyl CoA –

(1) 6 (2) 3
(3) 12 (4) 15

BRP002

3. The formation of Acetyl Co-A from pyruvic acid is the result of its :-

(1) Reduction
(2) Dehydration
(3) Phosphorylation
(4) Oxidative decarboxylation

BRP003

4. Pyruvate dehydrogenase complex is used in converting -

(1) Pyruvate to glucose
(2) Glucose to pyruvate
(3) Pyruvic acid to lactic acid
(4) Pyruvate to acetyl Co-A

BRP004

5. The first member of TCA cycle is :-

(1) Oxalosuccinic acid
(2) Oxaloacetic acid
(3) Citric acid
(4) Cis aconitic acid

BRP005

6. Excess of ATP inhibits the enzyme :-

(1) Phosphofructokinase
(2) Hexokinase
(3) Aldolase (Lyases)
(4) Pyruvate decarboxylase

BRP006

7. End product of glycolysis is :-

(1) Citric acid
(2) Glyceraldehyde
(3) Phosphoglyceraldehyde
(4) Pyruvic acid

BRP007

8. Respiration in plants :-

(1) Occurs only during day
(2) Results in the formation of vitamins
(3) Occurs both during day and night
(4) Often requires CO₂

BRP008

9. The end products of respiration in plants are:

(1) CO₂, H₂O and energy
(2) Starch and O₂
(3) Sugar and O₂
(4) H₂O and energy

BRP009

10. Common immediate source of energy in cellular activity is :-

(1) Glucose (2) Aldohexose
(3) ATP (4) NAD

BRP010

11. The net gain of ATP molecules by glycolysis in aerobic condition is

(1) Zero (2) Two (3) Four (4) Eight

BRP011

12. Respiratory enzymes are localised in :-

(1) Ribosomes (2) Chloroplast
(3) Mitochondria (4) Chromoplast

BRP012

13. The organism in which Kreb's cycle does not occur in mitochondria is :-

(1) Yeast (2) *E. coli*
(3) *Ulothrix* (4) Plants

BRP013

- 14.** The first preferred respiratory substrate is :-
 (1) Glucose (2) Fats
 (3) Proteins (4) Polypeptides
BRP014
- 15.** Respiration occurs in :-
 (1) All living cells both in day and night
 (2) Non green cells only in day
 (3) Non green cells in both day and night
 (4) All living cells in day only
BRP015
- 16.** Respiration may take place -
 (1) In the presence of O_2
 (2) In the absence of O_2
 (3) In the presence or absence of O_2
 (4) Only in the presence of CO_2
BRP016
- 17.** The common phase between aerobic & anaerobic respiration is :-
 (1) TCA cycle
 (2) Krebs's cycle
 (3) Glycolysis
 (4) Photo respiration
BRP017
- 18.** The enzyme which converts glucose to glucose-6-phosphate -
 (1) Phosphorylase
 (2) Glucophosphorylase
 (3) Hexokinase
 (4) Phosphoglucomutase
BRP018
- 19.** Product formed by the activity of malic dehydrogenase is :-
 (1) Fumaric acid (2) Malic acid
 (3) Oxaloacetic acid (4) Succinic acid
BRP019
- 20.** Which of the following is 5-carbon compound of Krebs cycle ?
 (1) Citric acid
 (2) Fumaric acid
 (3) Oxalosuccinic acid
 (4) α -Ketoglutaric acid
BRP020
- 21.** SLP net gain of ATP from one molecule of glucose during glycolysis or EMP pathway -
 (1) 2 ATP (2) 6 ATP
 (3) 36 ATP (4) 38 ATP
BRP021
- 22.** Which enzyme breaks the fructose-1, 6-Bisphosphate ?
 (1) Hexokinase
 (2) Phosphatase
 (3) Aldolase
 (4) Phosphofructokinase
BRP022
- 23.** Acceptor of acetyl Co-A in Krebs-cycle is :-
 (1) Malic acid
 (2) Fumaric acid
 (3) α -ketoglutaric acid
 (4) Oxaloacetic acid
BRP023
- 24.** In which one of the following do the two names refer to one and the same thing ?
 (1) Krebs cycle and Calvin cycle
 (2) Tricarboxylic acid cycle and citric acid cycle
 (3) Citric acid cycle and Calvin cycle
 (4) Tricarboxylic acid cycle and urea cycle
BRP024

**AEROBIC RESPIRATION (ETS) TO
REPIRATORY QUOTIENT**

25. Which component of ETS is mobile carrier ?
(1) UQ (CO-Q) (2) Cyt - a
(3) Cyto - b (4) Cyt - f

BRP025

26. R.Q. is less than one at the time of respiration of :-
(1) Starch (2) Organic acid
(3) Glucose (4) Protein

BRP026

27. Conversion of pyruvic acid into ethyl alcohol is mediated by –
(1) Phosphatase
(2) Dehydrogenase
(3) Decarboxylase & dehydrogenase
(4) Catalase

BRP027

28. Which of the following is link between carbohydrate and fat metabolism ?
(1) CO₂ (2) Acetyl Co-A
(3) Pyruvic acid (4) Citric acid

BRP028

29. In the electron transport chain during terminal oxidation, the cytochrome, which donates electrons to O₂ is ?
(1) Cytochrome-b (2) Cytochrome-C
(3) Cytochrome-a₃ (4) Cytochrome-f

BRP029

30. The incomplete breakdown of sugars in anaerobic respiration results in the formation of :-
(1) Fructose and water (2) Glucose and CO₂
(3) Alcohol and CO₂ (4) Water and CO₂

BRP030

31. Cytochromes are concerned with :-
(1) Protein synthesis (2) Cellular digestion
(3) Cell division (4) Cell-respiration

BRP031

32. In respiration pyruvic acid is :-
(1) Formed only when oxygen is available
(2) One of the products of Krebs cycle
(3) Broken down into Acetyl Co-A and CO₂
(4) Oxidised into Alcohol

BRP032

33. Number of ATP molecules formed during aerobic respiration in break down of one glucose molecule via malate aspartate shuttle, is :-
(1) 38 (2) 18 (3) 28 (4) 4

BRP033

34. What causes R.Q. to vary ?
(1) Respiratory Substrate
(2) Light & O₂
(3) Respiratory Product
(4) Temperature

BRP034

35. When the evolution of CO₂ is more than the intake of O₂, the respired substrate should be:
(1) Fatty acid (2) organic acid
(3) Glucose (4) Polysaccharides

BRP035

36. **Assertion** : Breaking down processes within the living organism is anabolism and synthesis is catabolism.

Reason : The proteins would be degraded by proteases and the individual amino acids (after deamination) depending on their structure would enter the pathway at some stage within the Krebs cycle or even as pyruvate or acetyl CoA.

- (1) A and R both are correct.
(2) A and R both are incorrect.
(3) A is correct, R is incorrect.
(4) A is incorrect, R is correct.

BRP130

- 37.** How many molecules of ATP are produced per molecule of FADH_2 oxidised ?
(1) One (2) Two (3) Three (4) four
BRP037
- 38.** How many ATP molecules produced from the complete oxidation of a molecule of acetyl Co-A ?
(1) 38 ATP (2) 15 ATP
(3) 12 ATP (4) 4 ATP
BRP038
- 39.** How many ATP equivalents are produced by the oxidation of succinate into fumarate?
(1) 1 ATP (2) 2 ATP
(3) 3 ATP (4) 4 ATP
BRP039
- 40.** How many net ATP generates in aerobic respiration via glycerol phosphate shuttle in eukaryotes ?
(1) 38 ATP (2) 36 ATP
(3) 40 ATP (4) 80 ATP
BRP040
- 41.** How many ATP are produced from one molecule of Acetyl CoA ?
(1) 12 ATP (2) 10 ATP
(3) 5 ATP (4) 14 ATP
BRP131
- 42.** Anaerobic respiration takes place in :-
(1) Ribosome (2) Mitochondria
(3) Cytoplasm (4) Vacuole
BRP042
- 43.** During the formation of bread, it becomes porous due to release of CO_2 by the action of:-
(1) Yeast (2) Bacteria
(3) Virus (4) Protozoans
BRP043
- 44.** Chemiosmotic theory of ATP synthesis in the chloroplast and mitochondria is based on :-
(1) Proton gradient
(2) Accumulation of K ions
(3) Accumulation of Na ions
(4) Accumulation of Cl ions
BRP044
- 45.** Curd formation is the result of :-
(1) Aerobic respiration
(2) Glycolysis only
(3) Lactic acid fermentation
(4) Alcoholic fermentation
BRP045

EXERCISE-I (Conceptual Questions)

ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	3	2	4	4	2	1	4	3	1	3	4	3	2	1	1
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	3	3	3	3	4	1	3	4	2	1	4	3	2	3	3
Question	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Answer	4	3	1	1	2	4	2	3	2	2	1	3	1	1	3

Exercise - II (Previous Year Questions)

AIPMT/NEET

AIPMT 2014

1. In which one of the following processes CO_2 is **not released**?
- (1) Aerobic respiration in plants
 - (2) Aerobic respiration in animals
 - (3) Alcoholic fermentation
 - (4) Lactate fermentation

BRP058

NEET-II 2016

2. Which of the following biomolecules is common to respiration-mediated breakdown of fats, carbohydrates and proteins?
- (1) Pyruvic acid
 - (2) Acetyl CoA
 - (3) Glucose-6-phosphate
 - (4) Fructose 1,6-bisphosphate

BRP059

NEET-UG 2017

3. Which statement is wrong for Krebs' cycle?
- (1) There is one point in the cycle where FAD^+ is reduced to FADH_2
 - (2) During conversion of succinyl CoA to succinic acid, a molecule of GTP is synthesised
 - (3) The cycle starts with condensation of acetyl group (acetyl CoA) with pyruvic acid to yield citric acid
 - (4) There are three points in the cycle where NAD^+ is reduced to $\text{NADH} + \text{H}^+$

BRP060

NEET-UG 2018

4. What is the role of NAD^+ in cellular respiration?
- (1) It functions as an enzyme
 - (2) It functions as an electron carrier
 - (3) It is a nucleotide source for ATP synthesis
 - (4) It is the final electron acceptor for anaerobic respiration

BRP061

5. Which of these statements is **incorrect**?
- (1) Enzymes of TCA cycle are present in mitochondrial matrix.
 - (2) Glycolysis occurs in cytosol.
 - (3) Glycolysis operates as long as it is supplied with NAD that can pick up hydrogen atoms.
 - (4) Oxidative phosphorylation takes place in outer mitochondrial membrane.

BRP062

NEET-UG 2019

6. Respiratory Quotient (RQ) value of tripalmitin is:
- | | |
|----------|----------|
| (1) 0.9 | (2) 0.7 |
| (3) 0.07 | (4) 0.09 |
7. Conversion of glucose to glucose-6-phosphate, the first irreversible reaction of glycolysis, is catalyzed by:
- (1) Aldolase
 - (2) Hexokinase
 - (3) Enolase
 - (4) Phosphofructokinase

BRP063

BRP064

NEET-UG 2019 (Odisha)

8. Where is respiratory electron transport system (ETS) located in plants?
- (1) Mitochondrial matrix
 - (2) Outer mitochondrial membrane
 - (3) Inner mitochondrial membrane
 - (4) Intermembrane space

BRP065

NEET-UG 2020

9. The number of substrate level phosphorylations in one turn of citric acid cycle is :
- (1) Three
 - (2) Zero
 - (3) One
 - (4) Two

BRP066

NEET-UG [COVID-19] 2020

10. Pyruvate dehydrogenase activity during aerobic respiration requires :-
- (1) Calcium
 - (2) Iron
 - (3) Cobalt
 - (4) Magnesium

BRP067

NEET-UG 2021

11. Which of the following statements is incorrect?
- (1) During aerobic respiration, role of oxygen is limited to the terminal stage.
 - (2) In ETC (Electron Transport Chain), one molecule of $\text{NADH} + \text{H}^+$ gives rise to 2 ATP molecules, and one FADH_2 gives rise to 3 ATP molecules.
 - (3) ATP is synthesized through complex V.
 - (4) Oxidation-reduction reactions produce proton gradient in respiration.

BRP068

NEET-UG 2022

12. What is the net gain of ATP when each molecule of glucose is converted to two molecules of pyruvic acid ?
- (1) Six
 - (2) Two
 - (3) Eight
 - (4) Four
13. What amount of energy is released from glucose during lactic acid fermentation?
- (1) More than 18%
 - (2) About 10%
 - (3) Less than 7%
 - (4) Approximately 15%

BRP069

BRP070

Re-NEET-UG 2022

14. The number of time(s) decarboxylation of isocitrate occurs during single TCA cycle is :
- (1) One
 - (2) Two
 - (3) Three
 - (4) Four

BRP071

NEET-UG 2023

15. Given below are two statements : One is labelled as **Assertion A** and the other is labelled as **Reason R**:
- Assertion (A)** : ATP is used at two steps in glycolysis.
- Reason (R)** : First ATP is used in converting glucose into glucose-6-phosphate and second ATP is used in conversion of fructose-6-phosphate into fructose-1,6-diphosphate.
- In the light of the above statements, choose the **correct** answer from the options given below :
- (1) Both **A** and **R** are true but **R** is NOT the correct explanation of **A**.
 - (2) **A** is true but **R** is false.
 - (3) **A** is false but **R** is true.
 - (4) Both **A** and **R** are true and **R** is the correct explanation of **A**.

BRP122

16. Match List I with List II.

	List-I		List-II
A.	Oxidative decarboxylation	I.	Citrate synthase
B.	Glycolysis	II.	Pyruvate dehydrogenase
C.	Oxidative phosphorylation	III.	Electron transport system
D.	Tricarboxylic acid cycle	IV.	EMP pathway

Choose the correct answer from the options given below :-

- (1) A-II, B-IV, C-I, D-III
- (2) A-III, B-I, C-II, D-IV
- (3) A-II, B-IV, C-III, D-I
- (4) A-III, B-IV, C-II, D-I

BRP123

NEET-UG 2023 (Manipur)

17. How many times decarboxylation occurs during each TCA cycle ?

- (1) Thrice
- (2) Many
- (3) Once
- (4) Twice

BRP124

18. Fatty acids are connected with the respiratory pathway through :-

- (1) Acetyl CoA
- (2) α -Ketoglutaric acid
- (3) Dihydroxy acetone phosphate
- (4) Pyruvic acid

BRP125

NEET-UG 2024

19. Identify the step in tricarboxylic acid cycle, which does not involve oxidation of substrate.

- (1) Malic acid $\rightarrow$ Oxaloacetic acid
- (2) Succinic acid $\rightarrow$ Malic acid
- (3) Succinyl-CoA $\rightarrow$ Succinic acid
- (4) Isocitrate $\rightarrow$ α -ketoglutaric acid

BRP126

20. Match List I with List II.

	List-I		List-II
A.	Citric acid cycle	I.	Cytoplasm
B.	Glycolysis	II.	Mitochondrial matrix
C.	Electron transport system	III.	Intermembrane space of mitochondria
D.	Proton gradient	IV.	Inner mitochondrial membrane

Choose the **correct** answer from the options given below :-

- (1) A-I, B-II, C-III, D-IV
- (2) A-II, B-I, C-IV, D-III
- (3) A-III, B-IV, C-I, D-II
- (4) A-IV, B-III, C-II, D-I

BRP127

RE-NEET-UG 2024

21. Match List-I with List-II.

	List-I		List-II
A.	ETS Complex I	I.	NADH Dehydrogenase
B.	ETS Complex II	II.	Cytochrome bC_1
C.	ETS Complex III	III.	Cytochrome C oxidase
D.	ETS Complex IV	IV.	Succinate Dehydrogenase

Choose the **correct** answer from the options given below :-

- (1) A-IV, B-I, C-III, D-II
- (2) A-I, B-IV, C-II, D-III
- (3) A-III, B-I, C-IV, D-II
- (4) A-I, B-II, C-IV, D-III

BRP128

Respiration in Plants

22. Which of the following are **correct** about cellular respiration ?

- (A) Cellular respiration is the breaking of C-C bonds of complex organic molecules by oxidation.
- (B) The entire cellular respiration takes place in Mitochondria.
- (C) Fermentation takes place under anaerobic condition in germinating seeds.

(D) The fate of pyruvate formed during glycolysis

depends on the type of organism also.

(E) Water is formed during respiration as a result of O_2 accepting electrons and getting reduced

Choose the **correct** answer from the options given below :-

- (1) A, C, D, E only (2) A, B, E only
- (3) A, B, C, E only (4) B, C, D, E only

BRP129

EXERCISE-II (Previous Year Questions)

ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	4	2	3	2	4	2	2	3	3	4	2	2/3	3	2	4
Question	16	17	18	19	20	21	22								
Answer	3	4	1	3	2	2	1								

Exercise - III

Master Your Understanding

(A) NCERT BASED QUESTIONS

- Glycolysis is present in :-
(1) Plants and animals only.
(2) Plants, animals and fungi only.
(3) Animals only.
(4) All living organisms.
BRP072
- The RQ for proteins is :
(1) 1 (2) 0.7 (3) 0.9 (4) 0
BRP073
- Glycerol would enter the respiratory pathway only after being converted to –
(1) Fatty acid (2) Acetyl CoA
(3) PGAL (4) Pyruvic acid
BRP074
- Final Decarboxylation in Krebs cycle occur between-
(1) Citric acid and α -ketoglutaric acid
(2) α -ketoglutaric acid and succinic acid
(3) Succinic acid and malic acid
(4) Malic acid and oxaloacetic acid
BRP075
- Pyruvate, which is formed by the glycolytic catabolism of carbohydrates in the cytosol, after it enters mitochondrial matrix, undergoes :-
(1) Oxidative carboxylation
(2) Oxidative decarboxylation
(3) Reductive carboxylation
(4) Carboxylation
BRP076
- The products formed from glycolysis are :-
(1) Pyruvate, CO_2 , ATP
(2) Pyruvate, ATP, $\text{NADH} + \text{H}^+$
(3) Acetyl CoA, ATP, $\text{NADH} + \text{H}^+$
(4) Acetyl CoA, ATP, H_2O
BRP077

- During conversion of succinyl Co-A to succinic acid a molecule of GTP is formed, this process is known as :-
(1) Oxidative phosphorylation
(2) Substrate level phosphorylation
(3) Photophosphorylation
(4) Terminal oxidation
BRP078
- In Glycolysis, glucose form two molecules of pyruvic acid, this is called :-
(1) Complete oxidation
(2) Partial oxidation
(3) Photooxidation
(4) Terminal oxidation
BRP079
- How many ATP molecules are directly synthesised in glycolysis?
(1) 6ATP (2) 4ATP
(3) 36ATP (4) 8ATP
BRP080
- When carbohydrates are used as substrate & anaerobically oxidised; the value of RQ will be:
(1) 1 (2) 0
(3) ∞ (4) less than 1
BRP081
- Which act as final hydrogen acceptor in E.T.S.?
(1) Oxygen (2) NAD^+
(3) FAD (4) NADP^+
BRP082
- Number of ATP produced when 1 molecule of pyruvic acid is used as respiratory substrate?
(1) 15 (2) 12 (3) 3 (4) 36
BRP083

- 13.** Which of the following is the energy yielding step of glycolysis?
 (1) Glucose $\rightarrow$ Glucose-6-phosphate
 (2) BPGA $\rightarrow$ PGA
 (3) Fructose 1, 6 biphosphate $\rightarrow$ PGAL
 (4) Phosphoglycerate $\rightarrow$ phosphoenolpyruvate
BRP084
- 14.** The passing on of the electrons removed as part of the hydrogen atoms to molecular oxygen with synthesis of ATP, the site of this process located—
 (1) in the matrix of the mitochondria
 (2) in the cytoplasm
 (3) in the intermembrane space of mitochondria
 (4) on the inner membrane of the mitochondria
BRP085
- 15.** In TCA cycle, isomerisation of citrate is followed by how many decarboxylation(s) to form succinic acid?
 (1) Two (2) Three
 (3) One (4) Four
BRP086
- 16.** In glycolysis there is no :-
 (1) Oxidation
 (2) Decarboxylation
 (3) Dehydrogenation
 (4) Splitting of C-C bonds
BRP087
- 17.** Which of the following is not an intermediate of Krebs cycle ?
 (1) OAA (2) α -ketoglutarate
 (3) Malate (4) PGAL
BRP088
- 18.** What is the product of two decarboxylations and two oxidation of isocitric acid ?
 (1) α -ketoglutaric acid (2) Succinyl Co A
 (3) Succinic acid (4) Fumaric acid
BRP089
- 19.** The respiratory quotient depends upon the:-
 (1) Type of respiratory substrate used during respiration
 (2) Amount of respiratory substrate used during respiration
 (3) Duration of respiration
 (4) Type of coenzymes used during respiration
BRP090
- 20.** In mitochondrial ETS, cytochrome 'C' acts as a mobile carrier for transfer of electrons between :-
 (1) Complex III and IV
 (2) Complex I and II
 (3) Complex II and III
 (4) Complex IV and V
BRP091
- 21.** The energy released by oxidation of respiratory substrates :
 (A) Comes out in a single step to increase the possibility of maximum ATP production
 (B) Is not used directly
 (C) Is used directly in the energy requiring processes of the organisms
 (D) Is trapped as chemical energy in the energy currency of the cell
 (1) C and D are incorrect
 (2) B and D are correct
 (3) A and B are correct
 (4) A and D are incorrect
BRP092

22. How many ATP molecules and during which steps, are directly synthesised in EMP pathway from one glucose molecule?

- (1) 4 ATP, 2 in each PEP to pyruvic acid and BPGA to PGA
- (2) 8 ATP, 4 in each PEP to pyruvic acid and BPGA to PGA
- (3) 2 ATP, 1 in each Glucose to Glucose-6-P and Fructose-6-P to Fructose 1, 6 bisphosphate
- (4) 4 ATP, 2 in each Glucose to Glucose-6-P and Fructose-6-P to Fructose 1, 6 bisphosphate

BRP093

23. Which of the following enzyme(s) is/are involved in the conversion of pyruvic acid into CO₂ and ethanol?

- (1) Pyruvic acid dehydrogenase
- (2) Alcohol decarboxylase
- (3) Both (1) and (2)
- (4) Pyruvic acid decarboxylase

BRP094

24. The complete oxidation of one molecule of pyruvate by the stepwise removal of all the hydrogen atoms:

- (1) Leaving six molecules of CO₂
- (2) Leaving two molecules of CO₂
- (3) Leaving four molecules of CO₂
- (4) Leaving three molecules of CO₂

BRP095

25. In aerobic respiration, the ultimate or final electron acceptor is :

- (1) Atomic oxygen (2) Molecular oxygen
- (3) Cytochrome a₃ (4) Water

BRP096

26. Fermentation differs from aerobic respiration :-

- (1) In having partial breakdown of glucose
- (2) In producing less ATP per glucose
- (3) In having slow oxidation of NADH₂ to NAD⁺
- (4) All of the above

BRP097

27. Complete oxidation of which of the following respiratory substrate evolve less volume of CO₂ as compare to volume of O₂ consumed ?

- (1) Fats (2) Proteins
- (3) Carbohydrates (4) Both (1) and (2)

BRP098

28. What is the significance of respiration ?

- (1) Production of cellular energy currency
- (2) Provides carbon skeleton as precursor for synthesis of various chemicals
- (3) loss of weight
- (4) Both (1) and (2)

BRP099

29. Plants do not present great demands for gaseous exchange because :

- (1) They are autotrophic
- (2) Photosynthesis and respiration work mutually
- (3) In plants there is less need of energy
- (4) Plants are regulators

BRP100

30. Select out the correct sequence of glycolytic steps:

- (1) PGAL → 3-PGA → 1,3-BPGA → PEP
- (2) PGAL → 1,3-BPGA → PEP → 3-PGA
- (3) PGAL → 1,3-BPGA → 3-PGA → PEP
- (4) PGAL → PEP → 1,3-BPGA → 2-PGA

BRP101

31. During respiration of *Yeast* which of the following enzyme is not used in oxygen stressed conditions ?

(1) Enolase
(2) Pyruvic acid decarboxylase
(3) Alcohol dehydrogenase
(4) Aconitase

BRP102

32. How much amount of energy present in glucose, get released during lactic acid and alcohol fermentation?

(1) 7 percent
(2) less than seven percent
(3) more than seven percent
(4) always 2 percent

BRP103

33. TCA cycle starts with condensation of acetyl group with :

(1) OAA (2) Water
(3) NAD (4) both (1) and (2)

BRP104

34. During TCA which of the following intermediate is a result of two successive decarboxylations ?

(1) Oxalosuccinic acid
(2) α -ketoglutaric acid
(3) Succinyl Co-A
(4) Cis aconitic acid

BRP105

35. Which of the following ETC complex is directly involved in reduction of oxygen ?

(1) Complex-I (2) Complex-II
(3) Complex-III (4) Complex-IV

BRP106

36. When proteins are respiratory substrates the ratio of CO_2/O_2 would be about :

(1) 1.0 (2) 0.7 (3) 0.9 (4) 1.3

BRP107

(B) ANALYTICAL QUESTIONS

37. At how many steps CO_2 is released in aerobic respiration?

(1) One or two (2) Three
(3) Five (4) Twelve

BRP108

38. Green plants kept in light produce ATP from the glucose. This process is :

(1) Photophosphorylation
(2) Hill reaction
(3) Oxidative phosphorylation
(4) β -oxidation

BRP109

39. FADH_2 produced in Krebs's-cycle from -

(1) Isocitrate (2) α -ketoglutarate
(3) Succinate (4) Malate

BRP110

40. Aerobic respiration is how many times useful than anaerobic respiration ?

(1) 2 (2) 8
(3) 19 (4) 38

BRP111

41. RQ is less than one for :-

(1) Proteins and organic acids
(2) Fatty acids and organic acids
(3) Fatty acids and proteins
(4) Organic acids and carbohydrates

BRP112

42. The step in which $\text{NADH} + \text{H}^+$ is not produced is:-

(1) Succinyl-CoA $\rightarrow$ Succinate
(2) Pyruvate $\rightarrow$ Acetyl-CoA
(3) α -ketoglutarate $\rightarrow$ Succinyl-CoA
(4) Malate $\rightarrow$ OAA

BRP113

43. Which intermediate of Krebs cycle is used as a substrate for amino acid biosynthesis ?

- (1) Citric acid (2) α -ketoglutarate
(3) Succinyl-CoA (4) Isocitric acid

BRP114

44. Which of the following is a common feature between glycolysis and Krebs cycles?

- (1) Release of CO_2 .
(2) Formation of FADH_2 .
(3) Site of the processes.
(4) Dehydrogenation.

BRP115

45. In lactic acid fermentation, the final electron acceptor is -

- (1) Acetaldehyde (2) Ethyl alcohol
(3) $\text{NADH} + \text{H}^+$ (4) Pyruvic acid

BRP116

46. How many molecules of CO_2 are released in Krebs cycle per glucose molecule ?

- (1) Two (2) Three
(3) Four (4) Six

BRP117

47. After entry of pyruvic acid in mitochondrial matrix, which of the following does not take place?

- (1) Oxidation
(2) Decarboxylation
(3) Oxidative - decarboxylation
(4) ATP mediated phosphorylation

BRP118

48. What is incorrect about anaerobic respiration?

- (1) Partial breakdown of glucose
(2) Net gain of 2ATP
(3) Rapid oxidation of $\text{NADH} + \text{H}^+$ to NAD^+
(4) Reduction of pyruvic acid

BRP119

49. How many $\text{NADH} + \text{H}^+$ are formed in per turn of Krebs cycle ?

- (1) Two (2) Three
(3) Four (4) Five

BRP120

50. During alcoholic fermentation by yeast two molecules of glucose produce -

- (1) 3 molecules of ethanol+3 molecules of CO_2
(2) 6 molecules of ethanol+6 molecules of CO_2
(3) 2 molecules of ethanol+2 molecules of CO_2
(4) 4 molecules of ethanol+4 molecules of CO_2

BRP121

51. Curing of tea leaves is brought about by the activity of -

- (1) Viruses (2) Fungi
(3) Bacteria (4) Mycorrhiza

BRP046

52. How many ATP molecules could maximally be generated from one molecule of glucose, if the complete oxidation of one mole of glucose to CO_2 and H_2O yields 686 kcal and the useful chemical energy available in the high energy phosphate bond of one mole of ATP is 12 Kcal?

- (1) 57 (2) 1
(3) 2 (4) 30

BRP047

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

- (1) Nucleic acids
(2) ATP in small stepwise units
(3) ATP in one large oxidation reaction
(4) Sugars

BRP048

54. All enzymes of TCA cycle are located in the mitochondrial matrix except one which is located in inner mitochondrial membrane in eukaryotes and in cytosol in prokaryotes. This enzyme is: -

(1) Succinate dehydrogenase
(2) Lactate dehydrogenase
(3) Isocitrate dehydrogenase
(4) Malate dehydrogenase

BRP049

55. Which one of the following mammalian cells are not capable of metabolising glucose to carbon-dioxide aerobically?

(1) Red blood cells
(2) White blood cells
(3) Unstriated muscle cells
(4) Liver cells

BRP050

56. The chemiosmotic coupling hypothesis of oxidative phosphorylation proposes that adenosine triphosphate (ATP) is form because: -

(1) A proton gradient forms across the inner membrane
(2) There is a change in the permeability of the inner mitochondrial membrane toward adenosine diphosphate (ADP)
(3) High energy bonds are formed in mitochondrial proteins
(4) ADP is pumped out of the matrix into the intermembrane space

BRP051

57. Read the following statements with respect to Krebs cycle and select the correct option:

(a) First stable product is 3C compound.
(b) At three steps NAD^+ is reduced.
(c) GTP is produced when succinyl CoA is converted to succinic acid.
(d) Citric acid is the first stable product.

(1) a, b & c are correct
(2) b, c & d are correct
(3) Only a is correct
(4) a, b & d are correct

BRP132

58. Aerobic respiratory pathway is appropriately termed: -

(1) Parabolic (2) Amphibolic
(3) Anabolic (4) Catabolic

BRP053

59. The energy-releasing metabolic process in which substrate is oxidised without an external electron acceptor is called:

(1) Glycolysis
(2) Fermentation
(3) Aerobic respiration
(4) Photorespiration

BRP054

60. In mitochondria, protons accumulate in the:

(1) Matrix
(2) Outer membrane
(3) Inner membrane
(4) Intermembrane space

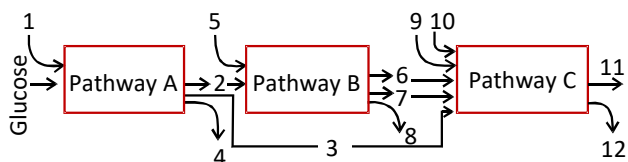
BRP055

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

(1) Acetyl CoA
(2) Glucose-6-phosphate
(3) Fructose-1,6-bisphosphate
(4) Pyruvic acid

BRP056

62. The three boxes in this diagram represent the three major biosynthetic pathways in aerobic respiration. Arrows represent net reactants or products.



Arrow numbered 4, 8 and 12 can all be:

- (1) FAD⁺ or FADH₂ (2) NADH
(3) ATP (4) H₂O

BRP057

EXERCISE-III

ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	4	3	3	2	2	2	2	2	2	3	1	1	2	4	1
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	2	4	2	1	1	2	1	4	4	2	4	4	4	2	3
Question	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Answer	4	2	4	3	4	3	2	3	3	3	3	1	2	4	4
Question	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Answer	3	4	3	2	4	3	1	2	1	1	1	2	2	2	4
Question	61	62													
Answer	1	3													