

NEET RESPIRATION IN PLANTS — PYQS

Max. Marks: 168

Questions: 42

Section A (MCQ) — 42 questions

Q.1 $2(C_{51}H_{98}O_6) + 145O_2 \longrightarrow 102CO_2 + 98H_2O +$
energy

The Respiratory Quotient (RQ) of a biomolecule used for respiration, as per the above equation would be : [NEET (UG) 2026]

- (1) Less than 0.5 (2) Between 1.25 and 2
(3) 1.0 (4) Between 0.5 and 0.95

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Q.2 Match **List I** with **List II** : [NEET (UG) 2026]

List-I (Process)		List-II (Location)	
A.	Glycolysis	I.	Inner mitochondrial membrane
B.	ETS	II.	Mitochondrial matrix
C.	Accumulation of protons	III.	Cytoplasm
D.	Krebs' cycle	IV.	Intermembrane space

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

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Q.3 How many molecules of pyruvic acid are produced at the end of glycolysis from 206 molecules of glucose? [RE-NEET (UG) 2026]

- (1) 412 (2) 206 (3) 309 (4) 103

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Q.4 The complex II of mitochondrial electron transport chain is also known as [NEET (UG) 2025]

- (1) Cytochrome c oxidase
(2) NADH dehydrogenase
(3) Cytochrome bc_1
(4) Succinate dehydrogenase

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Q.5 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: [NEET (UG) 2024]

- (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

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Q.6 Identify the step in tricarboxylic acid cycle, which does not involve oxidation of substrate. [NEET (UG) 2024]

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

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Q.7 Match **List-I** with **List-II**: [RE-NEET (UG) 2024]

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

- (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

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Q.8 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 :

[RE-NEET (UG) 2024]

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

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Q.9 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-bisphosphate.

In the light of the above statements, choose the correct answer from the options given below :

[NEET (UG) 2023]

- (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.

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Q.10 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 :

[NEET (UG) 2023]

- (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

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Q.11 What is the net gain of ATP when each molecule of glucose is converted to two molecules of pyruvic acid?

[NEET (UG) 2022]

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

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Q.12 What amount of energy is released from glucose during lactic acid fermentation?

[NEET (UG) 2022]

- (1) Approximately 15% (2) More than 18%
 (3) About 10% (4) Less than 7%

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Q.13 The 5-C compound formed during TCA cycle is

[NEET (UG) 2022 (Phase 2)]

- (1) Fumaric acid (2) α -ketoglutaric acid
 (3) Oxalosuccinic acid (4) Succinic acid

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Q.14 The number of time(s) decarboxylation of isocitrate occurs during single TCA cycle is

[NEET (UG) 2022 (Phase 2)]

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

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Q.15 Match List-I with List-II

List - I		List - II	
a.	Porins	i.	Pink coloured nodules
b.	Leghaemoglobin	ii.	Lumen of thylakoid
c.	H^+ accumulation	iii.	Amphibolic pathway
d.	Respiration	iv.	Huge pores in outer membrane of mitochondria

Choose the correct answer from the options given below.

[NEET (UG) 2022 (Phase 2)]

- (1) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
 (2) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)
 (3) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)
 (4) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)

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Q.16 Which of the following statements is incorrect?

[NEET (UG) 2021]

- (1) Oxidation-reduction reactions produce proton gradient in respiration
- (2) During aerobic respiration, role of oxygen is limited to the terminal stage.
- (3) 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
- (4) ATP is synthesized through complex V

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Q.17 The number of substrate level phosphorylations in one turn of citric acid cycle is [NEET (UG) 2020]

- (1) Zero (2) One (3) Three (4) Two

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Q.18 Conversion of glucose to glucose-6-phosphate, the first irreversible reaction of glycolysis, is catalyzed by [NEET (UG) 2019]

- (1) Enolase (2) Phosphofructokinase
(3) Aldolase (4) Hexokinase

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Q.19 Respiratory Quotient (RQ) value of tripalmitin is : [NEET (UG) 2019]

- (1) 0.07 (2) 0.09 (3) 0.9 (4) 0.7

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Q.20 What is the role of NAD^+ in cellular respiration?

[NEET 2018]

- (1) It is the final electron acceptor for anaerobic respiration.
- (2) It functions as an enzyme.
- (3) It functions as an electron carrier.
- (4) It is a nucleotide source for ATP synthesis.

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Q.21 Which of these statements is incorrect?

[NEET 2018]

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

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Q.22 Which statement is wrong for Krebs' cycle?

[NEET 2017]

- (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 $\text{NADH} + \text{H}^+$.

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Q.23 Which of the following biomolecules is common to respiration-mediated breakdown of fats, carbohydrates and proteins? [NEET 2016 (Phase 2)]

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

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Q.24 Oxidative phosphorylation is [NEET 2016 (Phase 2)]

- (1) formation of ATP by transfer of phosphate group from a substrate to ADP
- (2) oxidation of phosphate group in ATP
- (3) addition of phosphate group to ATP
- (4) formation of ATP by energy released from electrons removed during substrate oxidation.

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Q.25 Cytochromes are found in [AIPMT 2015 (Cancelled)]

- (1) cristae of mitochondria
- (2) lysosomes
- (3) matrix of mitochondria
- (4) outer wall of mitochondria.

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Q.26 In which one of the following processes CO_2 is not released? [AIPMT 2014]

- (1) Aerobic respiration in plants
- (2) Aerobic respiration in animals
- (3) Alcoholic fermentation
- (4) Lactic fermentation

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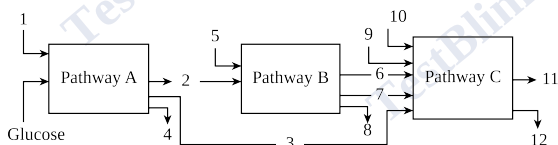
Q.27 Which of the metabolites is common to respiration-mediated breakdown of fats, carbohydrates and proteins? [NEET 2013]

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

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Q.28 The three boxes in this diagram represent the three major biochemical pathways in aerobic respiration. Arrows represent net reactants or products.



Arrows numbered 4, 8 and 12 can all be

[NEET 2013]

- (1) H_2O
- (2) FAD or FADH_2
- (3) NADH
- (4) ATP .

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Q.29 In mitochondria, protons accumulate in the

[AIPMT 2011 (Mains)]

- (1) outer membrane
- (2) inner membrane
- (3) intermembrane space
- (4) matrix

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Q.30 The energy-releasing metabolic process in which substrate is oxidised without an external electron acceptor is called

[AIPMT 2010 (Prelims)]

- (1) glycolysis
- (2) fermentation
- (3) aerobic respiration
- (4) photorespiration

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Q.31 Aerobic respiratory pathway is appropriately termed

[AIPMT 2009]

- (1) parabolic
- (2) amphibolic
- (3) anabolic
- (4) catabolic.

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Q.32 The energy-releasing metabolic process in which substrate is oxidised without an external electron acceptor is called

[AIPMT 2008]

- (1) glycolysis
- (2) fermentation
- (3) aerobic respiration
- (4) photorespiration

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Q.33 The chemiosmotic coupling hypothesis of oxidative phosphorylation proposes that adenosine triphosphate (ATP) is formed because

[AIPMT 2008]

- (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

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Q.34 The overall goal of glycolysis, Krebs' cycle and the electron transport system is the formation of

[AIPMT 2007]

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

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Q.35 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

[AIPMT 2007]

- (1) isocitrate dehydrogenase
- (2) malate dehydrogenase
- (3) succinate dehydrogenase
- (4) lactate dehydrogenase

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Q.36 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?

[AIPMT 2006]

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

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Q.37 During which stage in the complete oxidation of glucose are the greatest number of ATP molecules formed from ADP?

[AIPMT 2005]

- (1) Glycolysis
- (2) Krebs' cycle
- (3) Conversion of pyruvic acid to acetyl CoA
- (4) Electron transport chain

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Q.38 In glycolysis, during oxidation electrons are removed by

[AIPMT 2004]

- (1) ATP
- (2) glyceraldehyde-3-phosphate
- (3) NAD^+
- (4) molecular oxygen.

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full solution



Q.39 In alcohol fermentation [AIPMT 2003]

- (1) triose phosphate is the electron donor while acetaldehyde is the electron acceptor
- (2) triose phosphate is the electron donor while pyruvic acid is the electron acceptor
- (3) there is no electron donor
- (4) oxygen is the electron acceptor.

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Q.40 In which one of the following do the two names refer to one and same thing? [AIPMT 2003]

- (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

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Q.41 How many ATP molecules are produced by aerobic oxidation of one molecule of glucose? [AIPMT 2002]

- (1) 2 (2) 4 (3) 38 (4) 34

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Q.42 Cytochrome is [AIPMT 2001]

- (1) metallo flavo protein
- (2) Fe containing porphyrin pigment
- (3) glycoprotein
- (4) lipid.

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ANSWER KEY

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