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NEET PHOTOSYNTHESIS IN HIGHER PLANTS — CYCLIC AND NON-CYCLIC PHOTOPHOSPHORYLATION, CHEMIOSMOTIC HYPOTHESIS — PYQS

Max. Marks: 40 **Questions:** 10

Section A (MCQ) — 10 questions

Q.1 Which of the following combinations is required for chemiosmosis? [NEET (UG) 2023]

(1) Membrane, proton pump, proton gradient, NADP synthase

(2) Proton pump, electron gradient, ATP synthase

(3) Proton pump, electron gradient, NADP synthase

(4) Membrane, proton pump, proton gradient, ATP synthase

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Q.2 Which one of the following is not true regarding the release of energy during ATP synthesis through chemiosmosis? It involves: [NEET (UG) 2022]

(1) Breakdown of proton gradient

(2) Breakdown of electron gradient

(3) Movement of protons across the membrane to the stroma

(4) Reduction of NADP to $NADPH_2$ on the stroma side of the membrane

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Q.3 Identify the correct statements regarding chemiosmotic hypothesis:
Choose the correct answer from the options given below:

A. Splitting of the water molecule takes place on the inner side of the membrane.

B. Protons accumulate within the lumen of the thylakoids.

C. Primary acceptor of electron transfers the electrons to an electron carrier.

D. NADP reductase enzyme is located on the stroma side of the membrane.

E. Protons increase in number in stroma.

[NEET (UG) 2022 (Phase 2)]

(1) B, C and E only (2) A, B and E only

(3) A, B and D only (4) B, C and D only

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Q.4 Which of the following statements is incorrect? [NEET (UG) 2021]

(1) Cyclic photophosphorylation involves both PS I and PS II

(2) Both ATP and NADPH + H^+ are synthesized during non-cyclic photophosphorylation.

(3) Stroma lamellae have PS I only and lack NADP reductase

(4) Grana lamellae have both PS I and PS II

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Q.5 In a chloroplast the highest number of protons are found in [NEET 2016 (Phase 1)]

(1) intermembrane space (2) antennae complex

(3) stroma (4) lumen of thylakoids.

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Q.6 Read the following four statements (A – D).
How many of the above statements are right?

A. Both photophosphorylation and oxidative phosphorylation involve uphill transport of protons across the membrane.

B. In dicot stems, a new cambium originates from cells of pericycle at the time of secondary growth.

C. Stamens in flowers of *Gloriosa* and *Petunia* are polyandrous.

D. Symbiotic nitrogen fixers occur in free-living state also in soil. [AIPMT 2012 (Mains)]

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

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Q.7 Read the following four statements, (i), (ii), (iii) and (iv) and select the right option having both correct statements.

Statements : [AIPMT 2010 (Mains)]

(i) Z scheme of light reaction takes place in presence of PS I only.

(ii) Only PS I is functional in cyclic photophosphorylation.

(iii) Cyclic photophosphorylation results into synthesis of ATP and $NADPH_2$.

(iv) Stroma lamellae lack PS II as well as NADP reductase.

(1) (ii) and (iv) (2) (i) and (ii)
(3) (ii) and (iii) (4) (iii) and (iv)

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Q.8 Cyclic photophosphorylation results in the formation of [AIPMT 2009]

(1) ATP and NADPH (2) ATP, NADPH and O_2
(3) ATP (4) NADPH.

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Q.9 Chemiosmotic theory of ATP synthesis in the chloroplasts and mitochondria is based on [AIPMT 2005]

(1) Proton gradient
(2) Membrane potential
(3) Accumulation of Na^+ ions
(4) Accumulation of K^+ ions

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Q.10 Which one of the following concerns photophosphorylation? [AIPMT 2003]

(1) $ADP + AMP \xrightarrow{\text{Light energy}} ATP$
(2) $ADP + \text{Inorganic } PO_4 \xrightarrow{\text{Light energy}} ATP$
(3) $ADP + \text{Inorganic } PO_4 \longrightarrow ATP$
(4) $AMP + \text{Inorganic } PO_4 \xrightarrow{\text{Light energy}} ATP$

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ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	
Ans.	**4**	**2**	**3**	**1**	**4**	**1**	**1**	**3**	**1**	**2**	