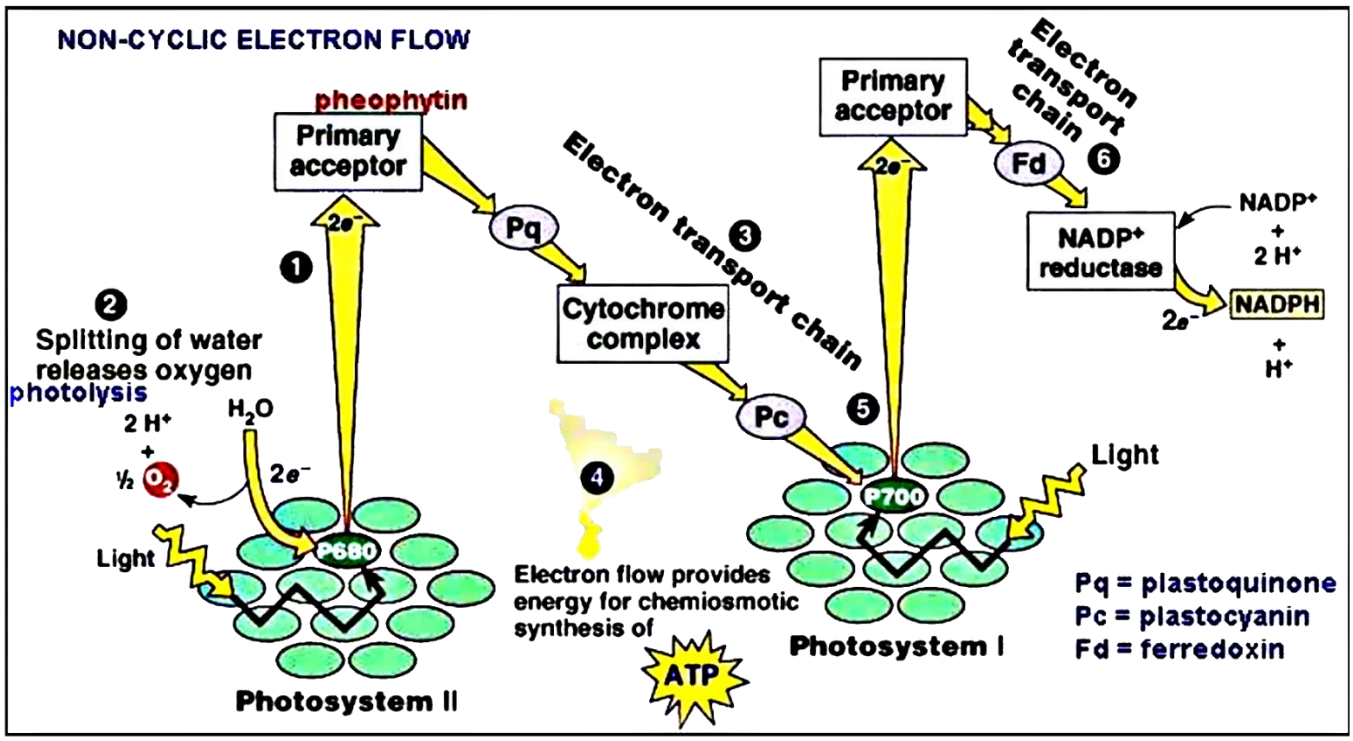
Photosynthesis _II



Q.1. The oxygen liberated during the photosynthesis comes from

A. CO_2

B. Water

C. Photosynthetic enzymes

D. Carbohydrates

1. Ans. B.

$H_2O \rightarrow H^+ + O_2$

When a photon of tight strikes the reaction centre of PS II it emites an electron Two H_2O molecules bind to an enzyme at reaction centre and enzyme splits the water and H^+ are released in the lumen and also O_2 is produced

Q.7. In non-cyclic photophosphorylation

A. ATP is synthesised only

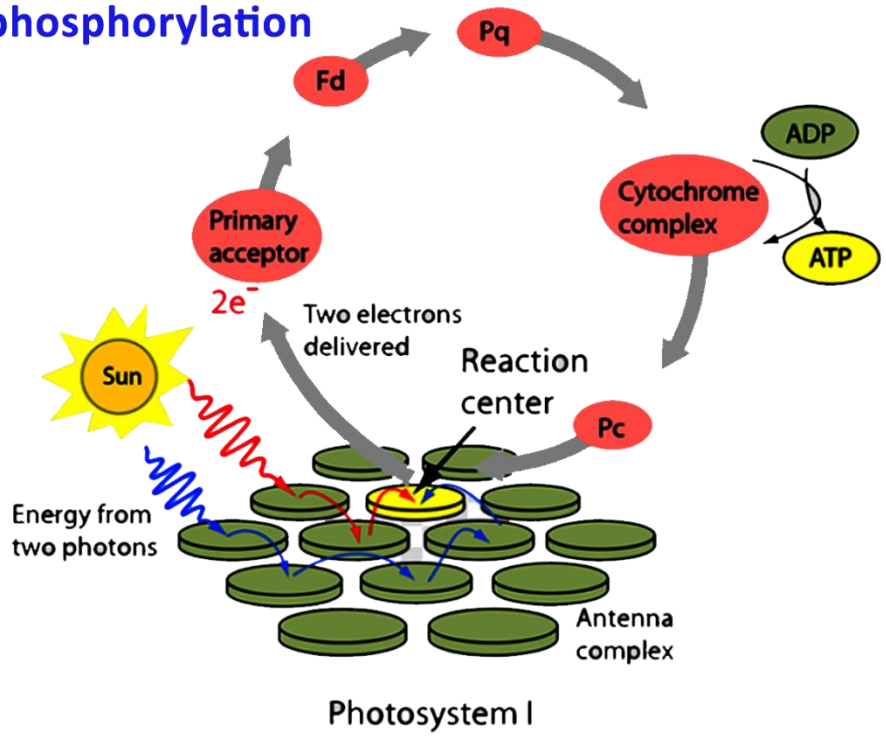
B. Last electron donor is ferredoxin

C. NADP reductase activity requires H^+ from stroma

D. There is involvement of PS-I only

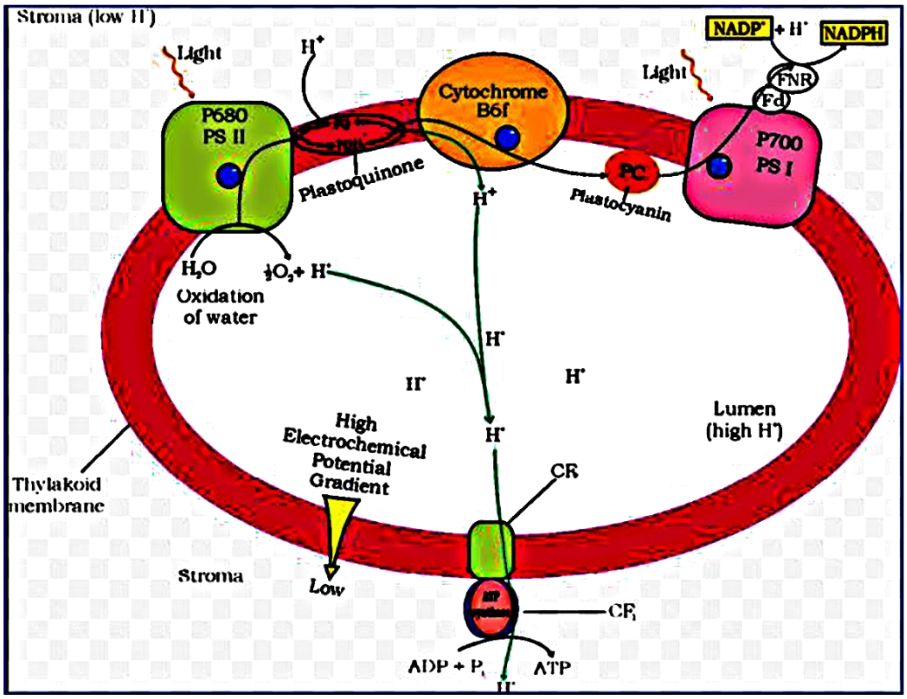
7. Ans. C.

Cyclic Photophosphorylation



Photosystem I

CHEMI- OSMOTIC HYPOTHESIS



Q. The chemiosmotic coupling hypothesis of oxidative phosphorylation proposes that adenosine tri phosphate is formed because?

AIIMS 2016

A. A proton gradient forms across the inner mitochondrial membrane

B. There is a change in the permeability of the inner mitochondrial membrane towards ADP

C. High energy bonds are formed in mitochondrial proteins

D. ADP is pumped out of the matrix into the intermembrane space

Q.2. **Chemiosmotic hypothesis for generation of ATP during light reaction was first explained by**

A. **Hill**

B. **Amold**

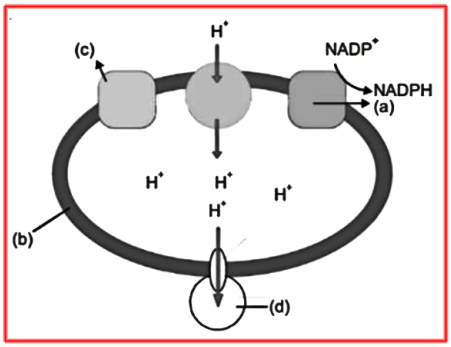
C. **P.Mitchell**

D. **Van Niel**

2.Ans. **C.**

Chemiosmotic theory for ATP synthesis was proposed by P.Mitchell.

Q.5. **Examine the figure given below and select right option giving all the four parts (a, b, c, d) correctly identified.**



Options	(a)	(b)	(c)	(d)
A.	Photosystem-II	Thylakoid membrane	Photosystem-I	ATP synthetase
B.	Photosystem-I	Thylakoid membrane	Photosystem-II	F_1
C.	Photosystem-I	Inner chloroplast membrane	Photosystem-II	F_0
D	Photosystem-II	Thylakoid membrane	Cytochrome b & f	F_1

5. Ans. B.

6. Ans. C.

Cyclic phosphorylation, cycled e^- many times, and through ETS converts ADP to ATP.

Q.6. Cyclic photophosphorylation releases

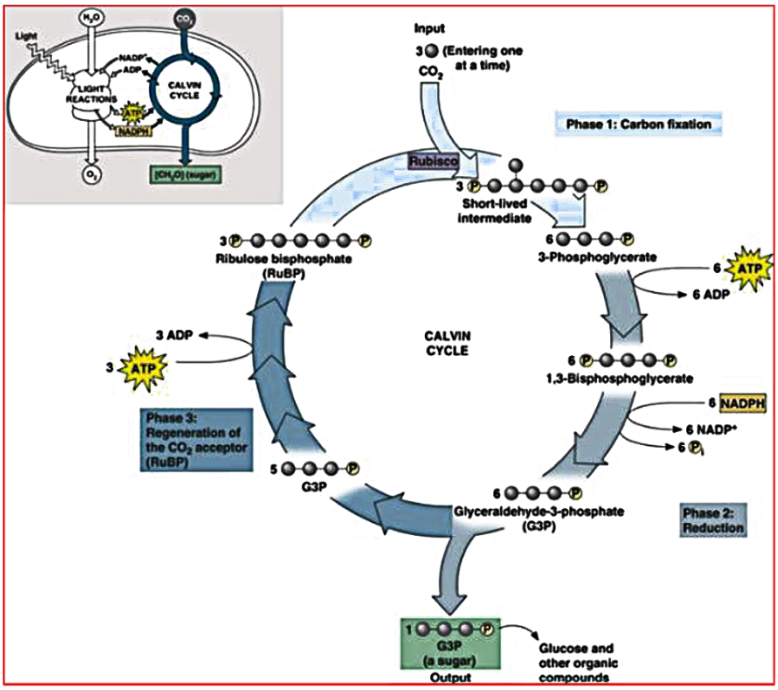
A. ATP and $NADPH_2$

B. ATP, $NADPH_2$ and oxygen

C. ATP only

D. $NADPH_2$ only

DARK REACTION OR BIOSYNTHETIC PHASE



Q.3. **Which among the following is not a step in Calvin cycle?**

A. **Carboxylation**

B. **Reduction**

C. **Photophosphorylation**

D. **Regeneration**

3.Ans. C.

Q. Fixation of one CO_2 molecule through Calvin cycle requires?

JIPMER 2017

A. 1 ATP and 2 $NADPH_2$

B. 2 ATP and 2 $NADPH_2$

C. 3 ATP and 2 $NADPH_2$

D. 2 ATP and 1 $NADPH_2$

Q. Phosponol pyruvate (PEP) is the primary CO_2 acceptor in

[NEET-2017]

A. C_3 plants

B. C_4 plants

C. C_2 plants

D. C_3 and C_4 plants

Q.4. The enzyme responsible for carboxylation reaction (CO_2 fixation) in C_3 plants is

A. RuBP oxygenase

B. Pyruvate decarboxylase

C. RuBP carboxylase

D. PEP carboxylase

4. Ans. C.

In C_3 plant carboxylation reaction is catalysed by enzyme RuBP carboxylase.

Q.8. Select the correct match

	Column-I		Column-II
a.	OEC	(i)	Primary e^- acceptor
b.	NADP reductase	(ii)	Photolysis of H_2O
c.	Succinyl CoA	(iii)	Outer surface of thylakoid membrane
d.	Phaeophytin	(iv)	Chlorophyll synthesis

A. a(ii), b(iii), c(iv), d(i)

B. a(ii), b(iii), c(i), d(iv)

C. a(iii), b(i), c(ii), d(iv)

D. a(i), b(ii), c(iii), d(iv)

8. Ans. A.

Photolysis of water occurs by OEC, NADP reductase present on the outer surface of thylakoid chlorophyll synthesized by cuccinyl CoA.

9. Ans. B.

RuBP is CO_2 acceptor and enzyme is RUBISCO.

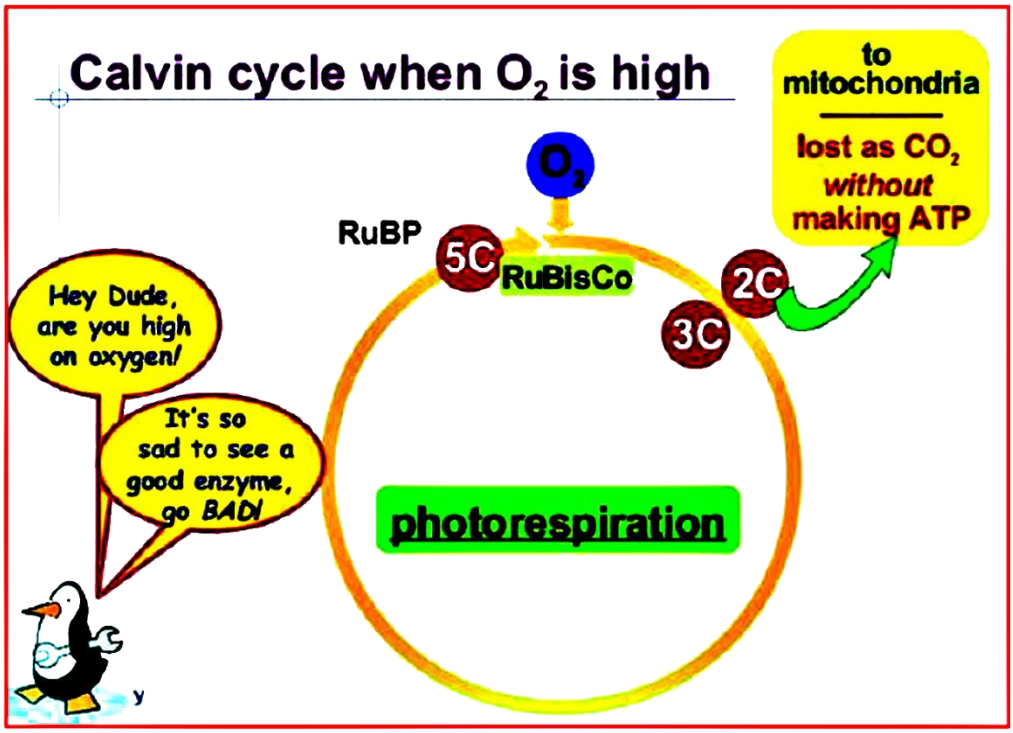
Q.9. CO_2 acceptor, and carboxylating enzyme in C_3 plants are respectively

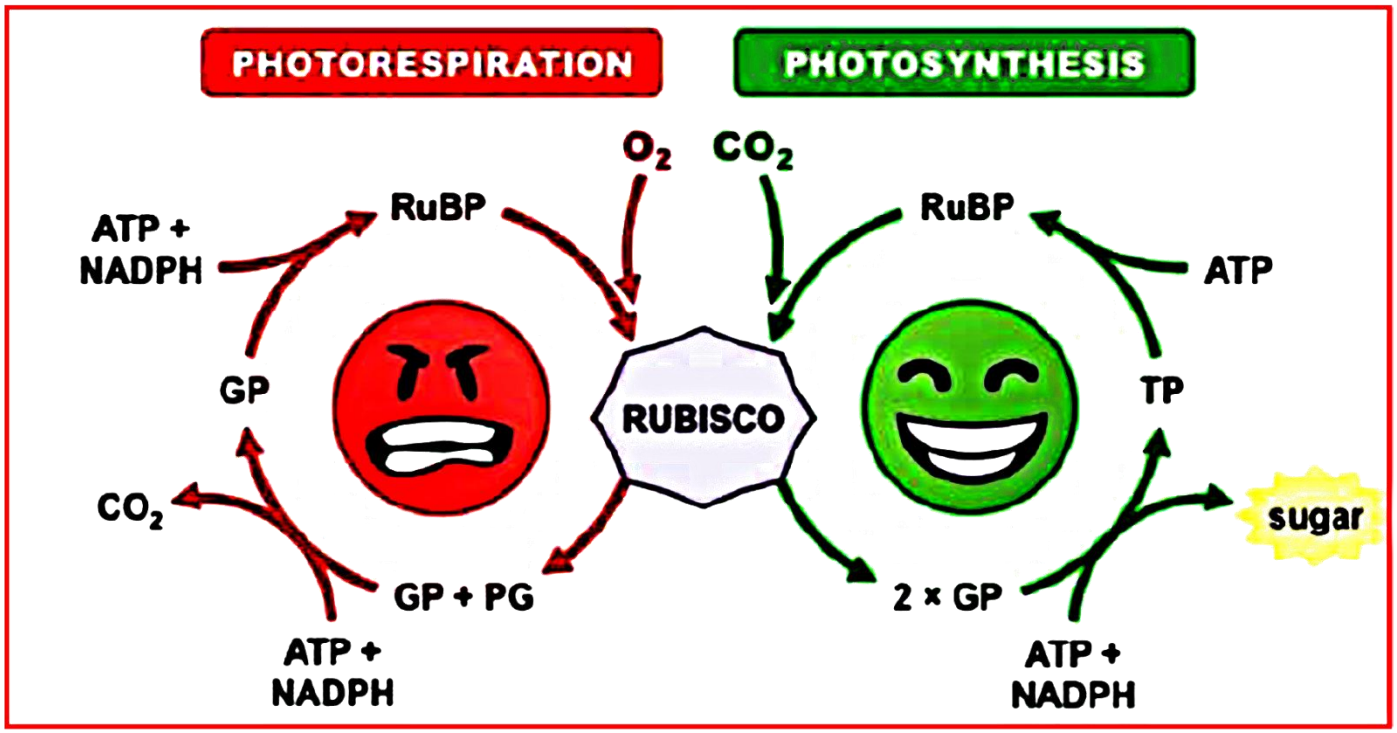
A. PET, PEPCO

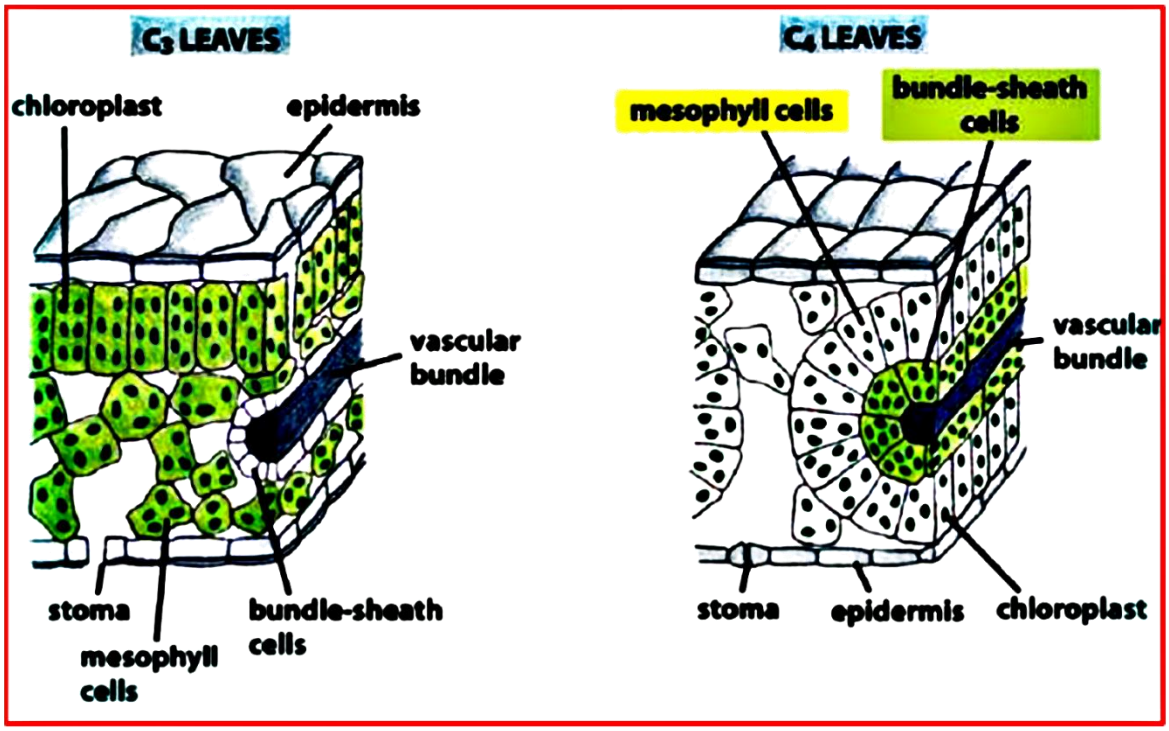
B. RuBP, RUBISCO

C. OAA, RUBISCO

D. 3 PGA, RUBISCO




PHOTORESPIRATION
PHOTOSYNTHESIS
O_2
CO_2
RuBP
RuBP
ATP + NADPH
ATP
GP
TP
RUBISCO
CO_2
sugar
GP + PG
2 × GP
ATP + NADPH
ATP + NADPH


C_3 LEAVES
chloroplast
epidermis
vascular bundle
stoma
mesophyll cells
bundle-sheath cells
C_4 LEAVES
mesophyll cells
bundle-sheath cells
vascular bundle
stoma
epidermis
chloroplast

Q. The process which makes major difference between C_3 and C_4 plants is

[NEET-2016]

A. Glycolysis **B. Calvin cycle**

C. Photorespiration **D. Respiration**

Q. A process that makes important difference between C_3 and C_4 plants is

[AIPMT-2012]

A. Photosynthesis

B. Photorespiration

C. Transpiration

D. Glycolysis

Q. In Kranz anatomy, the bundle sheath cells have

[AIPMT-2011]

A. Thin walls, no intercellular spaces and several chloroplast

B. Thick walls, many intercellular spaces and few chloroplasts

C. Thin walls, many intercellular spaces and no chloroplasts

D. Thick walls, no intercellular spaces and large number of chloroplasts

Q. Photosynthesis in C_4 plants is relatively less limited by atmospheric CO_2 levels because?

[AIIMS 2016]

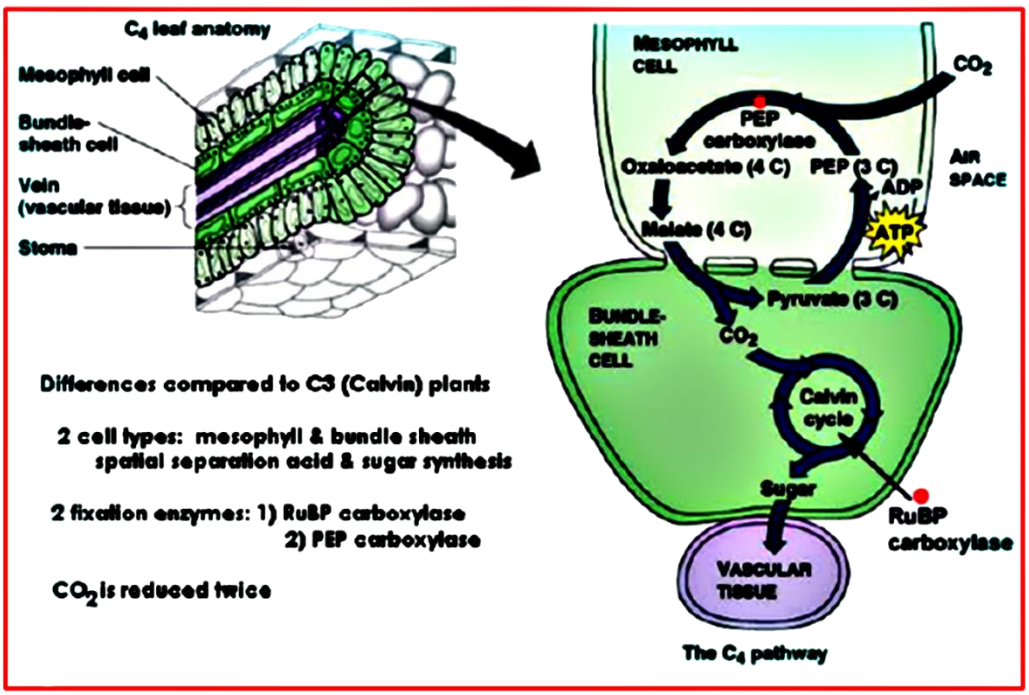
A. there is effective pumping of CO_2 into bundle sheath cells

B. RUBISCO in C_4 plants has higher affinity for CO_2

C. Six carbon acids are the primary initial CO_2 fixation products

D. The primary fixation of CO_2 is mediated via PEP carboxylase

C_4 plants



Q. A plant in your garden avoids photorespiratory losses, has improved water use efficiency, shows high rates of photosynthesis at high temperatures and has improved efficiency of nitrogen utilisation. In which of the following physiological groups would you assign this plant?

[NEET-2016]

A. Nitrogen fixer

B. C_3

C. C_4

D. CAM

Q. C_4 plants are more efficient in photosynthesis than C_3 plants due to

[AIPMT-2010]

A. Lower rate of photorespiration

B. Higher leaf area

C. Presence of larger number of chloroplasts in the leaf cells

D. Presence of thin cuticle

Q. Which of these is incorrect for C_4 plants?

[JIPMER 2018]

A. Kranz anatomy

B. CO_2 acceptor is PEP

C. PEP Case in mesophyll

D. RUBISCO in mesophyll

Q. C_4 plants have better productivity because?

[AIIMS-2017]

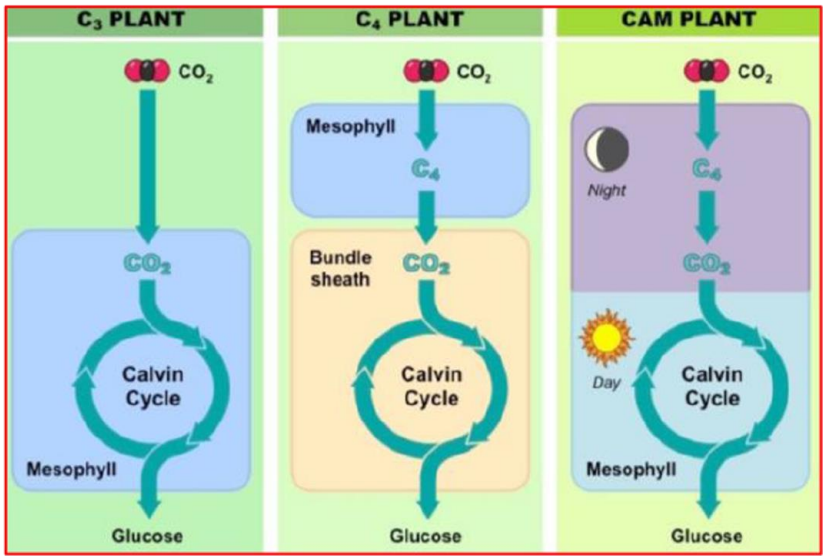
A. C_4 plants absorbs more light

B. C_4 plants absorbs more CO_2

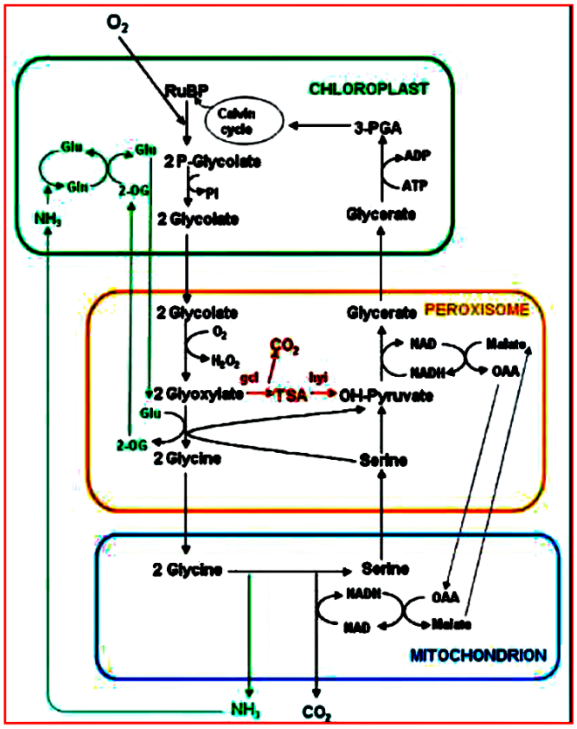
C. C_4 plants lack photorespiration

D. All of these

CAM Plants



C_2 CYCLE


O2
RuBP
Calvin cycle
CHLOROPLAST
3-PGA
Glu
Gln
Glu
2-OG
2 P-Glycolate
Pi
ADP
ATP
NH3
2 Glycolate
Glycerate
2 Glycolate
Glycerate
PEROXISOME
O2
H2O2
CO2
gcl
tyl
NAD
NADH
Malate
OAA
2 Glyoxylate
TSA
OH-Pyruvate
Glu
2-OG
2 Glycine
Serine
2 Glycine
Serine
NADH
NAD
OAA
Malate
MITOCHONDRION
NH3
CO2