<u>Photosynthesis – A2 9700 Biology Nov 2022</u>

1. Nov/2022/Paper_41/No.2

Pho	tosynthesis is an important energy transfer process.
(a)	Name one chloroplast pigment.
	[1]
(b)	Explain the relationship between the absorption spectrum of the main chloroplast pigments in a species of plant and the action spectrum for photosynthesis for that species.
	[2]
(c)	Explain why temperature can be a limiting factor of photosynthesis.
	120
	[3]

(d)	Outline how the light-independent stage of photosynthesis leads to the production of carbohydrates such as starch in plant leaves.
	[3]
	[Total: 9] Rapacaminhilde

2. Nov/2022/Paper_42/No.3

- (a) Photosynthesis is an energy transfer process that takes place in chloroplasts of plant cells.
 - (i) Fig. 3.1 shows a diagram of a chloroplast.

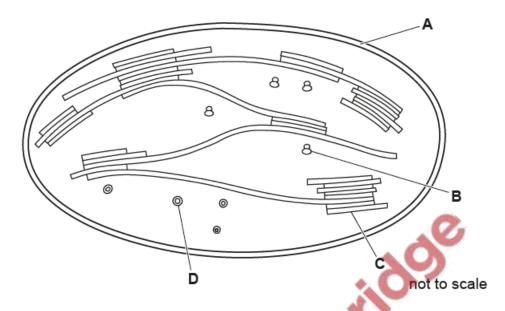


Fig. 3.1

Using the letters ${\bf A},\,{\bf B},\,{\bf C}$ or ${\bf D},$ identify the structure that:

	contains genes that code for some of the enzymes used in photosynthesis
•	is the site of synthesis of some of the enzymes used in photosynthesis.
	[2]

Explain how grana are adapted for their specific role in photosynthesis.
Palpa Califibility (4)

(ii)

- (b) An experiment was carried out to investigate the effect of changing light conditions on the pH of the chloroplast stroma. Scientists followed pH changes in chloroplast stroma using fluorescent chemicals that can be used as pH indicators.
 - Chloroplasts were isolated from cells.
 - A suspension of chloroplasts was prepared and kept in the dark for 180 seconds.
 - The chloroplasts were exposed to a period of light of fixed intensity for 240 seconds, then returned to dark conditions.
 - The pH of chloroplast stroma was continuously measured and recorded.

Fig. 3.2 shows the results of this experiment.

Describe the results shown in

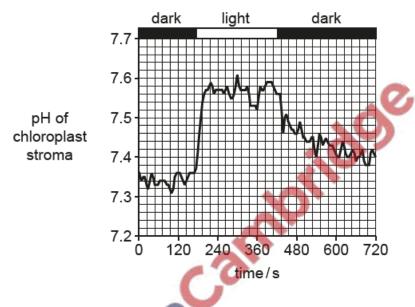


Fig. 3.2

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(ii)	Discuss during ph	how otopho	the sphory	results lation.	in	Fig. 3	3.2	support	that	chemiosm	osis	occurs
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