

# Candidate Marks Report

*Series : 6 2018*

This candidate's script has been assessed using On-Screen Marking. The marks are therefore not shown on the script itself, but are summarised in the table below.

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Centre No :	Assessment Code :	H420
Candidate No :	Component Code :	01
Candidate Name :		

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**Total Marks : 57 / 100**

In the table below 'Total Mark' records the mark scored by this candidate.  
'Max Mark' records the Maximum Mark available for the question.

<b>Paper:</b>	<b>H420/01</b>
<b>Paper</b>	<b>57 / 100</b>
<b>Total:</b>	
Question	Total / Max Mark Mark
1	1 / 1
2	1 / 1
3	0 / 1
4	0 / 1
5	0 / 1
6	1 / 1
7	0 / 1
8	1 / 1
9	1 / 1
10	0 / 1
11	0 / 1
12	1 / 1
13	1 / 1
14	0 / 1
15	0 / 1
16ai	2 / 2
16aii	1 / 2
16bi	1 / 1
16bii	2 / 3
16c	2 / 3
17ai	3 / 4
17aii	0 / 1
17b	1 / 2
17ci	1 / 2
17cii	2 / 2
18a	4 / 6
18b	1 / 3
18c	1 / 1
19a	2 / 3
19b	1 / 4

19c	0 / 6
20ai	2 / 3
20aai	1 / 2
20bi	3 / 3
20bii	2 / 2
21ai	1 / 4
21aai	1 / 2
21aiii	1 / 3
21b	0 / 1
22ai	3 / 3
22aai	1 / 2
22aiii	1 / 1
22b	1 / 2
23a	3 / 3
23b	2 / 4
23ci	2 / 2
23cii	2 / 3

## SECTION A

You should spend a maximum of 20 minutes on this section.

Write your answer to each question in the box provided.

Answer all the questions.

1 Which of the following statements, A to D, correctly explains a feature of an efficient gaseous exchange surface?

- A The layers are thin for a short diffusion distance. ✓
- B There is a good blood supply, so the system reaches equilibrium quickly. ✓
- C There is an increased surface area to reduce surface area to volume ratio. ✗
- D Ventilation takes place to reduce concentration gradient of dissolved gases. ✗

Your answer

A

[1]



2 The following are a series of organic molecules and the chemical processes that occur to convert them into different molecules.

Which of the rows, A to D, is correct?

- A nucleic acid  $\xrightarrow{\text{hydrolysis}}$  nucleotide  $\xrightarrow{\text{hydrolysis}}$  polynucleotide ✗
- B  $\alpha$ -glucose  $\xrightarrow{\text{condensation}}$  amylopectin  $\xrightarrow{\text{hydrolysis}}$   $\alpha$ -glucose ✓
- C amino acid  $\xrightarrow{\text{condensation}}$  dipeptide  $\xrightarrow{\text{hydrolysis}}$  polypeptide ✗
- D  $\beta$ -glucose  $\xrightarrow{\text{condensation}}$  cellulose  $\xrightarrow{\text{condensation}}$  maltose ✗

Your answer

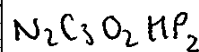
B

[1]



- 3 The following table describes the approximate percentage mass of different chemical elements in organic polymers.

	Polymer	N (%)	C (%)	O (%)	H (%)	P (%)	
X	A	nucleic acid	20.0	30.0	20.0	10.0	20.0
	B	carbohydrate	0.0	33.3	33.3	33.3	0.0
X	C	protein	30.0	10.0	10.0	0.0	50.0
X	D	lipid	0.0	50.0	49.0	1.0	0.0



Which of the rows, A to D, is correct?

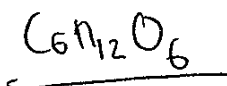
Your answer

**B**



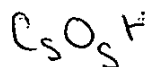
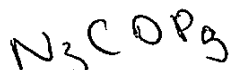
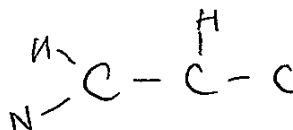
carb

C O H



1:2:1

[1]



Turn over for the next question



4 Which of the following statements, A to D, about DNA replication is correct?

- ~~A~~ A RNA will bind to DNA through complementary base-pairing. ✓  
 B The distance between the strands in the double helix will always be the same.  
 C The proportion of adenine in a nucleic acid will always equal the proportion of guanine. ✗  
 D The formation of phosphodiester bonds will occur in the same direction on each strand during DNA replication. ✗

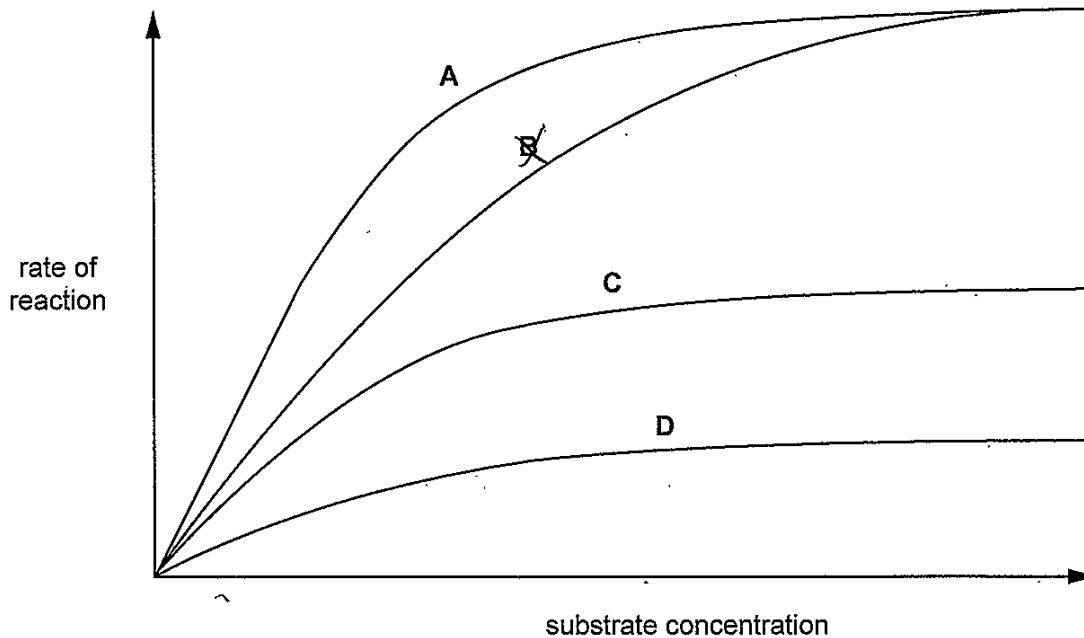
Your answer

B



[1]

5 The following graph shows the rate of reaction of an enzyme in different substrate concentrations.



Which letter, A to D, shows the rate of reaction with a fixed quantity of competitive inhibitor?

Your answer

D



[1]



6 Which of the statements, **A** to **D**, applies to transpiration **and** evaporation?

- A It occurs at a faster rate at higher humidity. ✓
- B It occurs at a slower rate at greater wind speed. ✗
- C It occurs at a slower rate at higher temperature. ✗
- D It occurs at the surface of leaves.

Your answer

D

[1]



7 Which of the statements, **A** to **D**, explains why diastole follows systole in the mammalian heart?

- A Cardiac muscle is myogenic. ✓
- B Cardiac muscle takes a short time to repolarise after being stimulated.
- C The aorta is capable of maintaining the pressure generated by the left ventricle.
- D The SAN receives impulses from the AVN.

Your answer

A



[1]

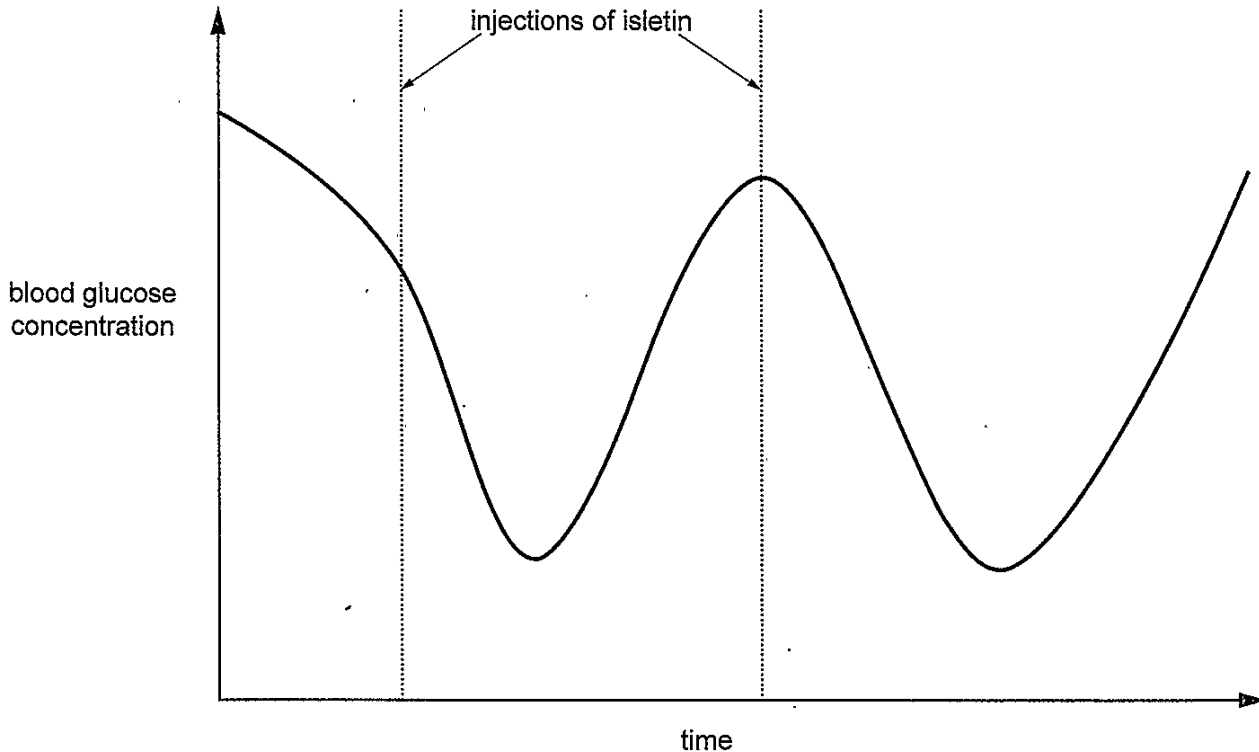


8 Banting and Best pioneered experiments into the functions of the pancreas.

In one experiment, they removed the pancreas of dogs. Shortly afterwards, the dogs developed the symptoms of diabetes.

- Banting ground up the removed pancreas to produce an extract.
- He called the extract "isletin".
- The isletin was then injected into dogs that had had their pancreas removed.
- He then tested the blood glucose concentration.

The graph below is a summary of the results.



Which of the following statements correctly explains these results?

- 1 Isletin is made in the  $\alpha$  cells in the islets of Langerhans.
- 2 Isletin reduces blood glucose concentration.
- 3 The effects of isletin are short-lived.

- A 1, 2 and 3  
 B Only 1 and 2  
 C Only 2 and 3  
 D Only 1

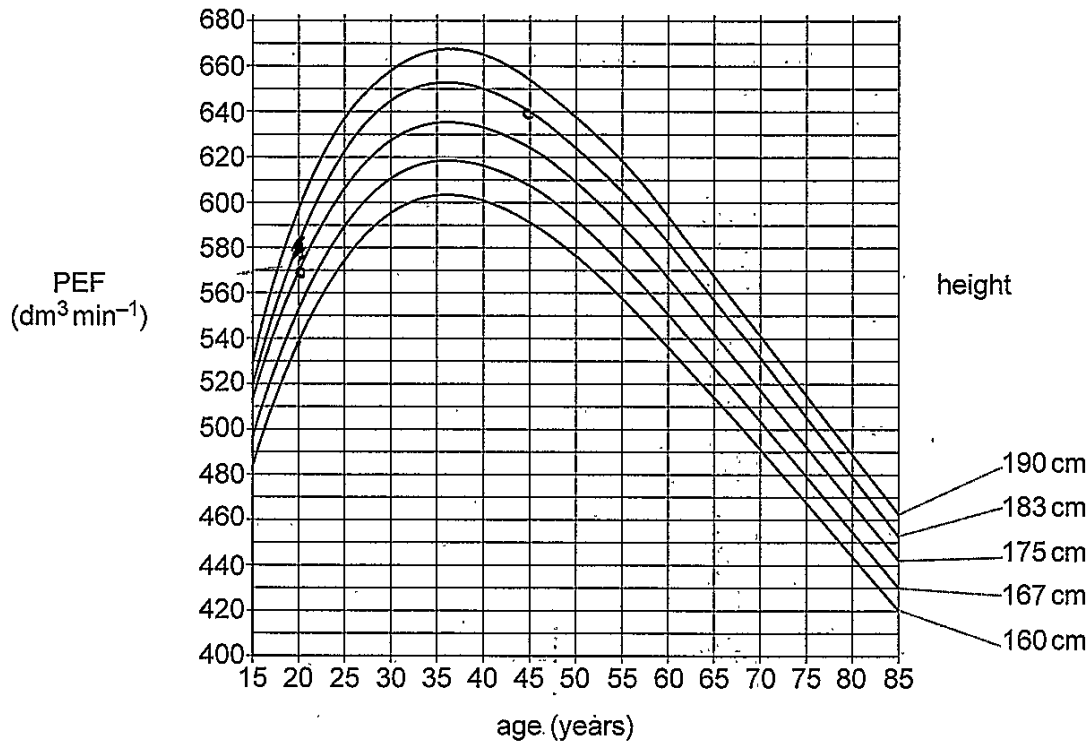
Your answer

C



9 Peak expiratory flow (PEF) is a measure of the maximum rate at which a person can exhale.

The graph below shows the typical PEF values for men of different ages and heights.



Which of the following is the percentage increase from the PEF of a 20 year old man of 175 cm to the PEF of a 45 year old man of 183 cm?

- A 19.4%
- B 10.9%
- C 12.3%
- D 8.1%

Your answer

C

$$20 \text{ year old} = 570$$

$$45 \text{ year old} = 640$$

$$\frac{640 - 570}{570} = 0.123$$

$$\frac{70}{570} = 0.12 \times 100$$

$$= 12.3$$

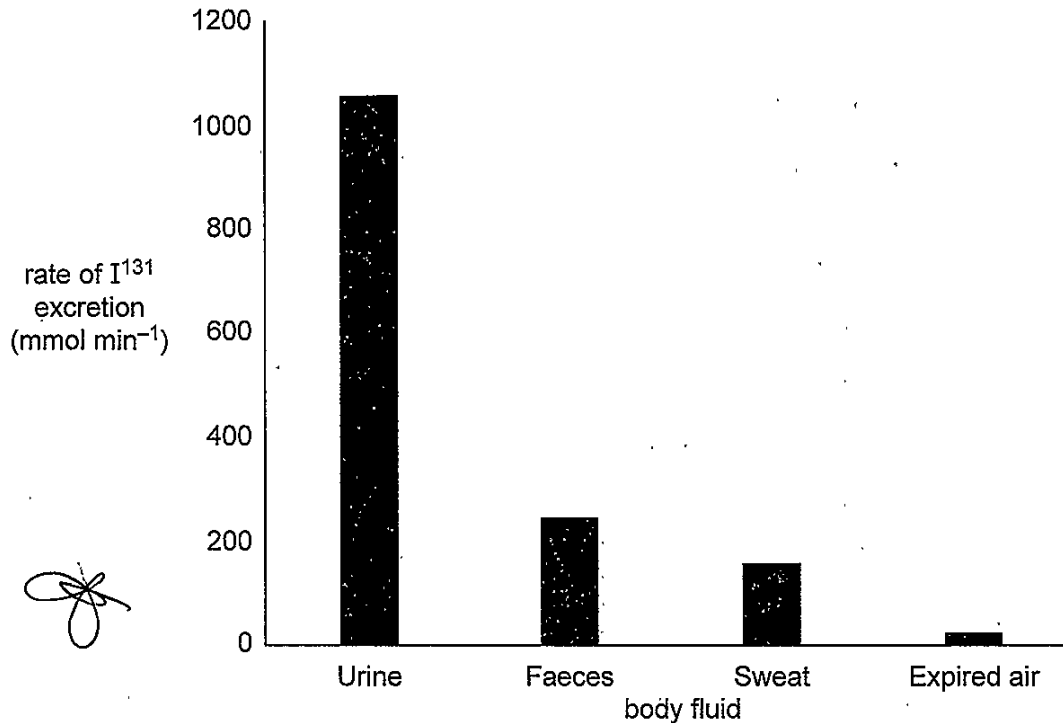




- 10 One treatment for thyroid cancer is radioactive iodine. The radioisotope  $I^{131}$  is used.

The thyroid gland absorbs any iodine that enters the body, so the radioactive isotope kills the cancerous cells in the thyroid gland. The  $I^{131}$  is then excreted from the body.

Different body fluids excrete different proportions of  $I^{131}$ , as shown in the following graph.



Which of the following, A to D, correctly explains the different proportions of  $I^{131}$  in each body fluid?

- A  $I^{131}$  is very soluble in water. ✓
- B  $I^{131}$  is able to cross capillary walls. ✓
- C The kidneys are more efficient at excreting  $I^{131}$  than the lungs. ✗
- D The thyroid gland is well supplied with blood. ✗

Your answer

A ✗

[1]



11 Which of the following, A to D, is a similarity in the way ATP is made in respiration and photosynthesis?

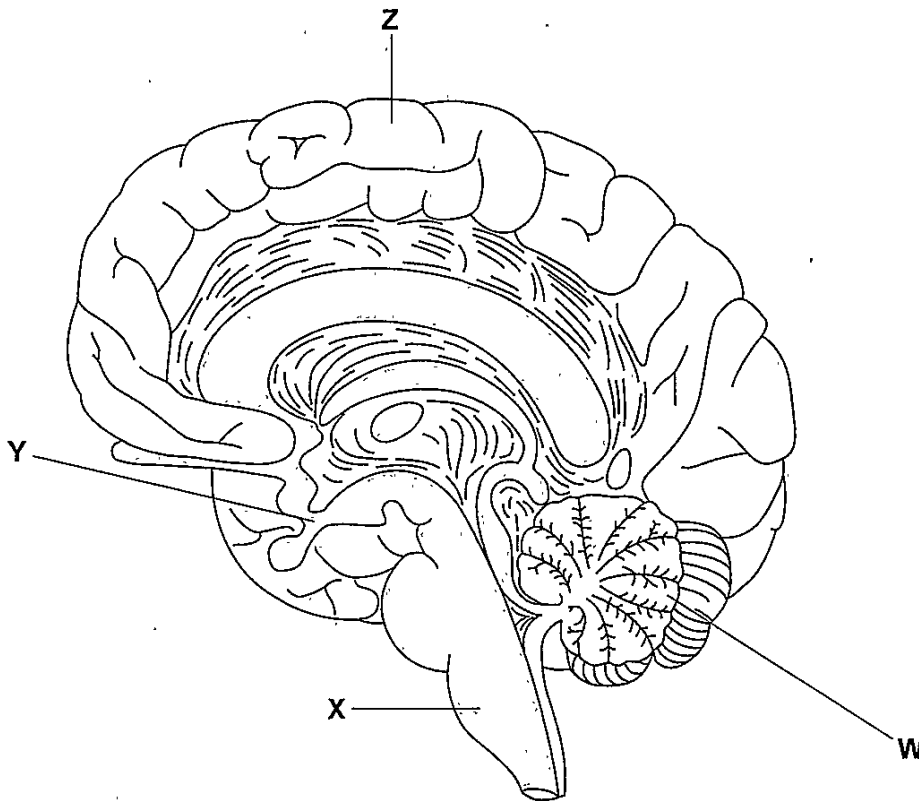
- A both involve NAD ✓
- B both involve substrate level phosphorylation 8
- C both involve photons ✗
- D both involve proton gradients ✓

Your answer

A ✗

[1]

12 The image below is a diagram of the human brain.



Which of the labelled regions would be directly involved in learning to play a musical instrument?

- A W and X
- B W and Y
- C W and Z
- D Y and Z

Your answer

C

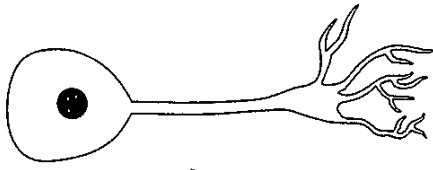
Turn over

[1]

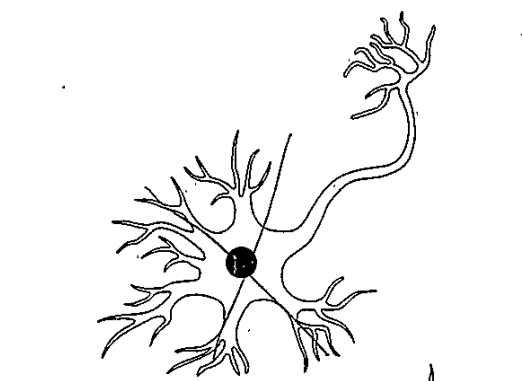


13

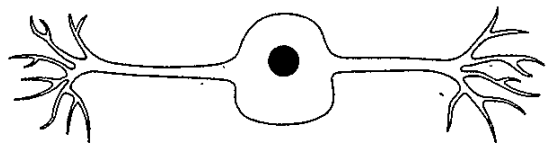
13 Which of the following diagrams, A to D, shows a sensory neurone?



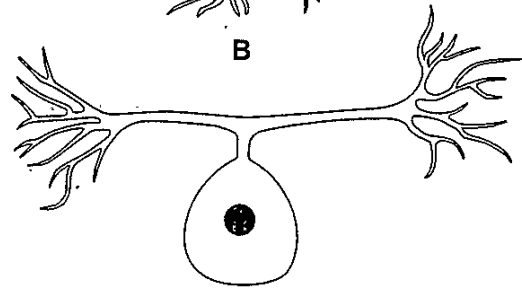
A



B



C



D

Your answer

D



[1]



- 14 The table below shows the membrane potentials of different neurones at a cholinergic synapse. The data were recorded on five separate occasions, as shown in the five rows.

	Membrane potential (mV)			
	Presynaptic neurone A	Presynaptic neurone B	Presynaptic neurone C	Postsynaptic neurone
1	+40	-70	-70	-70
2	-70	+40	-70	-70
3	-70	-70	+40	-70
4	+40	+40	-70	-70
5	+40	+40	+40	+40

Which of the following, A to D, explains these data?

- A divergence
- B hyperpolarisation
- C spatial summation
- D temporal summation

Your answer



0



[1]

- 15 The drug metoprolol prevents stimulation of post-synaptic receptors in the sympathetic nervous system.

Which of the following conditions could this drug be used to treat?

- 1 Muscle fatigue
- 2 Tachycardia
- 3 High blood pressure ✗

- A 1, 2 and 3 ✗
- B Only 1 and 2
- C Only 2 and 3 ✗
- D Only 1

Your answer



[1]



## SECTION B

Answer all the questions.

16 (a) Gestational diabetes is a medical condition that affects pregnant women. It results in high levels of glucose in the blood, even though the woman produces normal levels of insulin.

(i) Gestational diabetes is most similar to which **other** type of diabetes?

Explain your answer.

~~Type 1, because there is no insulin is inactive.~~

Type 2 ✓ because insulin is still being produced, ✓  
however it is unable to be used by the body. [2]

(ii) Suggest **two** ways a woman with gestational diabetes can manage her condition.

1 by <sup>taking</sup> injecting insulin ✓ when bloods are too high ✓  
glucose concentrations

2 by taking a hypotreatment (glucose) when blood sugars are too low. ✓  
concentrations [2]

(b) (i) Skeletal muscle is one of the main tissues where glucose is removed from the blood in response to insulin.

Name the other tissue.

liver tissues ✓ [1]

(ii) Explain why glucose is required for the contraction of skeletal muscle.

because it can be respired + produce ATP. ✓  
ATP is vital for muscle contraction ✓



- (c) During late pregnancy, women find ventilation more difficult, as the developing foetus reduces the volume of the thorax. This can lead to tiredness and difficulty breathing.

A student used a spirometer to measure ventilation in a woman who was 36 weeks pregnant.

Fig. 16.1 shows the trace produced.

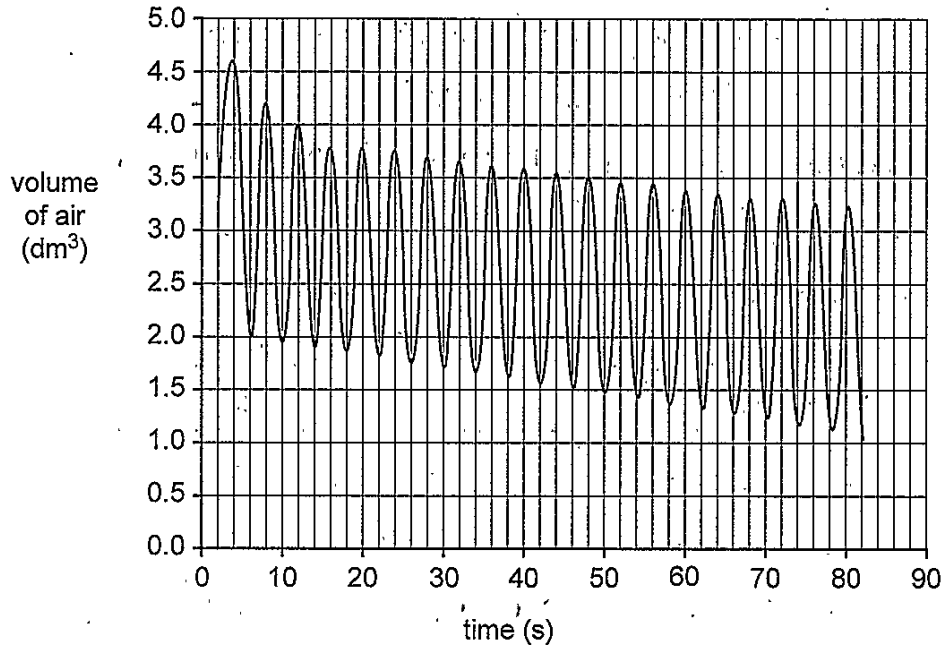


Fig. 16.1

Mean oxygen uptake rate at rest in women is around  $0.020 \text{ dm}^3 \text{ s}^{-1}$ .

Using these data, the student made the following conclusion:

My data show that being pregnant reduces rate of oxygen uptake by up to 20%.

→ 36 weeks

→ volume of air

→ how often you recorded air.

Evaluate this claim, using the data in Fig. 16.1.

The student claims their data shows the results of being pregnant, it doesn't, it shows the results of the 1 36 week pregnant woman they tested. Also, the data shows volume of air, not volume of oxygen, so the student can't assume this is the oxygen uptake. Therefore, their statement of a 20% decrease is invalid, because that's not what the results show. [3]



- 17 (a) Chromista are photosynthetic protists that live in water.

Chromista are different from other photosynthetic organisms because they contain the pigment chlorophyll c.

Chlorophyll c is not found in plants.

- (i) Outline the importance of photosynthetic pigments in photosynthesis.

They absorb the different wavelengths of light so that the electrons in the photosystems are able to be excited.

Without them, photosynthesis would be unable to take place, because the electrons would not be excited, and the light dependent reactions would be unable to take place. The reactants needed for the light independent stage would not be produced, so that would be unable to work as well. [4]

- (ii) The wavelengths of light absorbed by chlorophyll c are different from those wavelengths absorbed by chlorophyll a and chlorophyll b.

Suggest why Chromista need pigments that are different from those of other photosynthetic organisms.

because they live in water, so different wavelengths of light are available to the ones present on land. [1]



(b) Fig. 17.1 is a diagram of the chloroplast found in a Chromista cell.

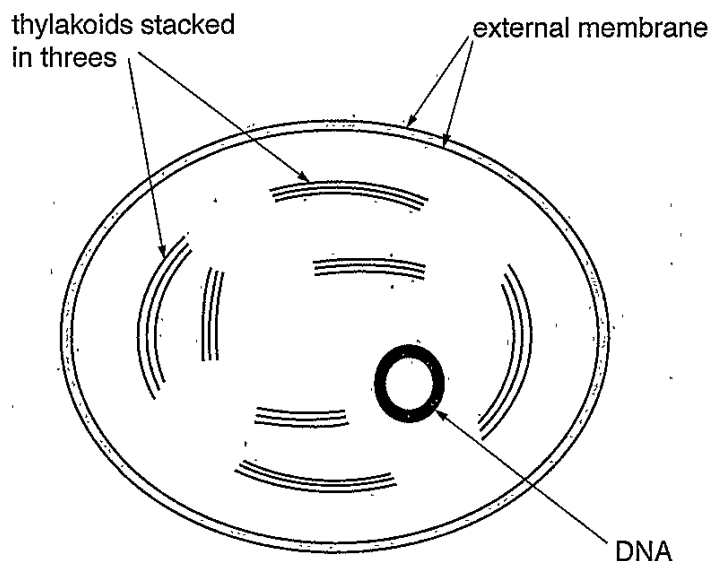


Fig. 17.1

Outline the structural differences between the Chromista chloroplast in Fig. 17.1 and the chloroplasts found in flowering plants.

The thylakoid stacks in Chromista contain less.....  
 (the thylakoid stacks (granum))  
 thylakoids than in chloroplasts in flowering plants. ✓  
 The DNA in plant chloroplasts is found in a nucleus  
 and is linear, whereas the DNA in Chromista  
 is circular, and not in a nucleus. The Chromista  
 would be much smaller than a chloroplast.





(c) Fig. 17.2 is a diagram of part of the plasma membrane of a Chromista cell.

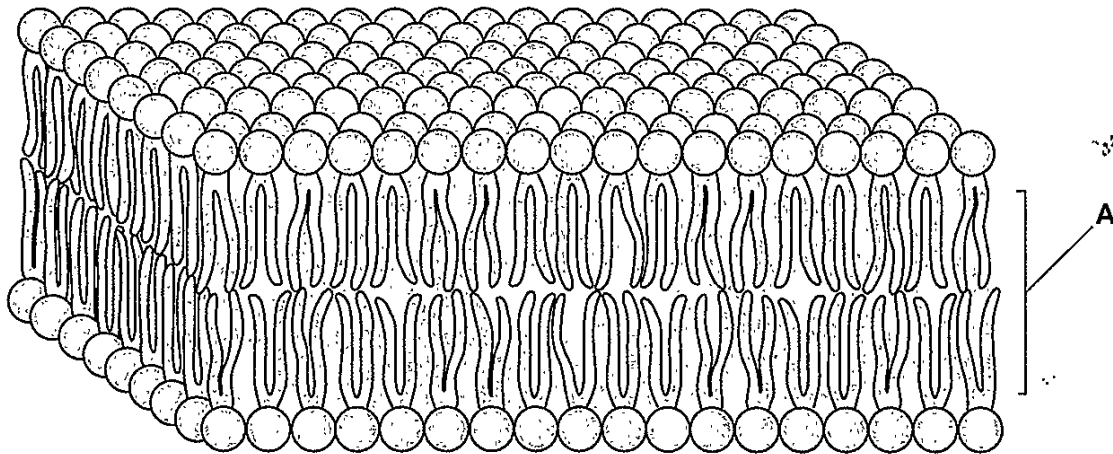


Fig. 17.2

- (i) State and explain how **one** property of region A in Fig. 17.2 contributes to the stability of the plasma membrane.

its hydrophobic, so it is repelled by water, meaning it will always form this stable membrane.

[2]

- (ii) There are differences between the plasma membrane and membranes within cells.

Outline the role of membranes **within** cells.

to keep the <sup>specific</sup> enzymes with its organelle, rather than floating in the cytoplasm. To keep the chemical reactions happening efficiently, because they are contained. To keep the organelles in the shape they should be to form vesicles for transporting substances into/out of around the cell.

[2]



18 (a)\* Plants lose water by transpiration.

The rate of transpiration varies between different species of plant.

The rate of transpiration can be measured using a potometer.

Plan an investigation into the rate of transpiration in two species of plant that would allow valid data to be collected.

Details of how to set up a potometer are not required.

- I would choose my <sup>different</sup> ~~two~~ species of plants ~~and~~.....
- I would then set up my potometer.....
- I would take a cutting from the first plant <sup>keeping it under water</sup> and ~~find~~ <sup>count</sup> the number, and size of leaves on the cutting. (to ensure my results are valid <sup>and reproducible</sup> ~~and~~ <sup>with other plants</sup>).....
- I would make sure I was in an environment where I could control, and be able to record the temperature, light intensity,  $O_2$  /  $CO_2$  concentration, humidity, and time the cutting was in the potometer, so I was able to keep these all constant.....
- I would then record my results straight away.....
- I would then repeat this using the same plant, with cuttings with similar <sup>surface areas of</sup> leaves.....
- I would then repeat with the other ~~species~~ <sup>species</sup>.....
- After ~~the~~ all the data was collected, I would present my results in a clear way (e.g using a graph) with their ~~means~~ means having been calculated so they are easy to compare.

using <sup>the same</sup> ~~similar~~ surface area of ~~leaves~~ leaves.

L2

~~two~~ species of plant.  
repeat with cuttings from same plant.  
- keep temp the same.  
- " light the same.

- keep type of water the same

- time how long you do it for  
- record results straight away.



(b) Plant cell walls are made of cellulose. Cellulose is a polymer of  $\beta$ -glucose.

Give three properties of cellulose that make it suitable as the basis of plant cell walls.

- 1 ... is a structural polymer, so provides strength.
- 2 ... is insoluble in water, so won't dissolve, or affect <sup>water</sup> potential.
- 3 ... it's long and thin.

[3]

(c) Cellulose cannot be digested by animals. Some mammals have bacteria in their stomachs that produce enzymes that can digest cellulose.

Explain whether the action of these enzymes is intracellular or extracellular.

is extracellular, because it is excreted out of the ~~cells~~ <sup>bacterial cells</sup>, into the stomach, where it breaks down the cellulose out of <sup>side</sup> the cells.

[1]



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Turn over for the next question



- 19 Honeypot ants belong to several different genera. Some specialised individuals are used as food storage vessels. These individuals have swollen abdomens that store various foods, which can be given to members of the colony when required.

One such individual is shown in Fig. 19.1.



Fig. 19.1

An investigation was carried out into the respiratory substrate of three different genera of honeypot ant, by measuring oxygen uptake and carbon dioxide production.

The data are shown in Table 19.1.

Genus	CO <sub>2</sub> produced (mm <sup>3</sup> s <sup>-1</sup> )	O <sub>2</sub> consumed (mm <sup>3</sup> s <sup>-1</sup> )
<i>Camponotus</i>	0.89	0.88
<i>Melophorus</i>	0.59	0.66
<i>Cataglyphis</i>	1.01	1.47

Table 19.1



(a) Use the data in Table 19.1 to suggest the likely diet of each genus of honeypot ant.

Justify your answer.

Genus	Diet	Justification
<i>Camponotus</i>	mainly carbohydrate	the RQ value is around 1
<i>Melophorus</i>	mainly lipids	it's RQ value is about 0.9
<i>Cataglyphis</i>	mainly lipids	it's RQ value is about 0.7

[3]

$$\frac{0.59}{0.66} = 0.893$$

$$\frac{1.61}{1.47} = 1.095 \approx 0.687$$



- (b) Chitin is a polysaccharide found in insects. It is used to form the hard outer casing of their bodies.

Fig. 19.2 shows the chemical structure of chitin.

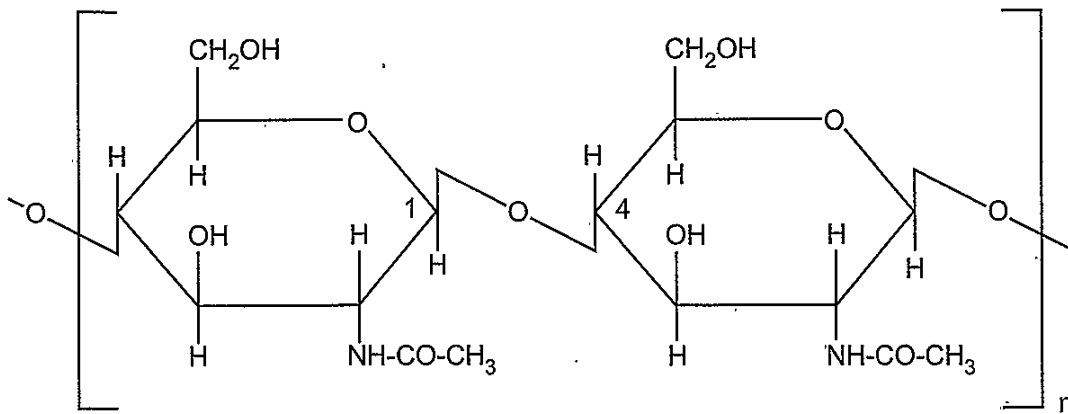


Fig. 19.2

Using information from Fig. 19.2, state **two** similarities and **two** differences between the structures of chitin and glycogen.

Similarity 1 both contain ~~hexose~~ 6 carbon rings

Similarity 2 both contain glycosidic bonds

Difference 1 chitin contains nitrogen

Difference 2 chitin contains more carbons in a chain than the same length of glycogen.

[4]



(c)\* Insects use glucose to generate ATP.

ADP + P<sub>i</sub>

⊗  
-H<sup>+</sup>

Outline the processes involved in the generation of ATP through chemiosmosis.

the glucose is respired by the insect. It is combined with an inorganic phosphate from ATP to form hexose phosphate, this happens again forming hexose bisphosphate.

Oxidative phosphorylation, a chemical gradient forms <sup>on either</sup> between the ~~inside~~ membrane so chemicals move due to chemiosmosis

ADP + Inorganic phosphate → ATP

happens in mitochondria.

✗

[6]





- 20 (a) A student carried out an investigation into the effect of ethanol on the permeability of cell membranes in beetroot.

The student's method comprised the following five steps:

1. Cut equal sized <sup>↗ what size</sup> pieces of beetroot using a cork borer.
2. Wash the pieces in running water. → how long
3. Place the pieces in 100 cm<sup>3</sup> of different concentrations of ethanol.
4. After 5 minutes, remove samples from each of the ethanol solutions.
5. Place each of the samples into a colorimeter to collect quantitative data. ↓ solutions

- (i) Each step in the student's method relies on certain assumptions.

For each assumption listed below, select the **numbered step** from the student's method that relies upon that assumption.

*Assumption A*

Pigment will only leak into the solution if membranes are disrupted.

Assumption A relates to step ... 3 ...

*Assumption B*

Absorbance is proportional to concentration of pigment.

Assumption B relates to step ... 5 ...

*Assumption C*

Pigment will be released when the beetroot is sliced.

Assumption C relates to step ... 1 ...  
[3]

- (ii) The student kept the ethanol solutions at a constant temperature. State **two other** variables which need to be controlled in this investigation to ensure the data collected are valid.

1. The amount of time / how long the pieces are washed
2. the time each sample is left in the ethanol

[2]



(b) Fig. 20.1 shows the graph plotted by the student.

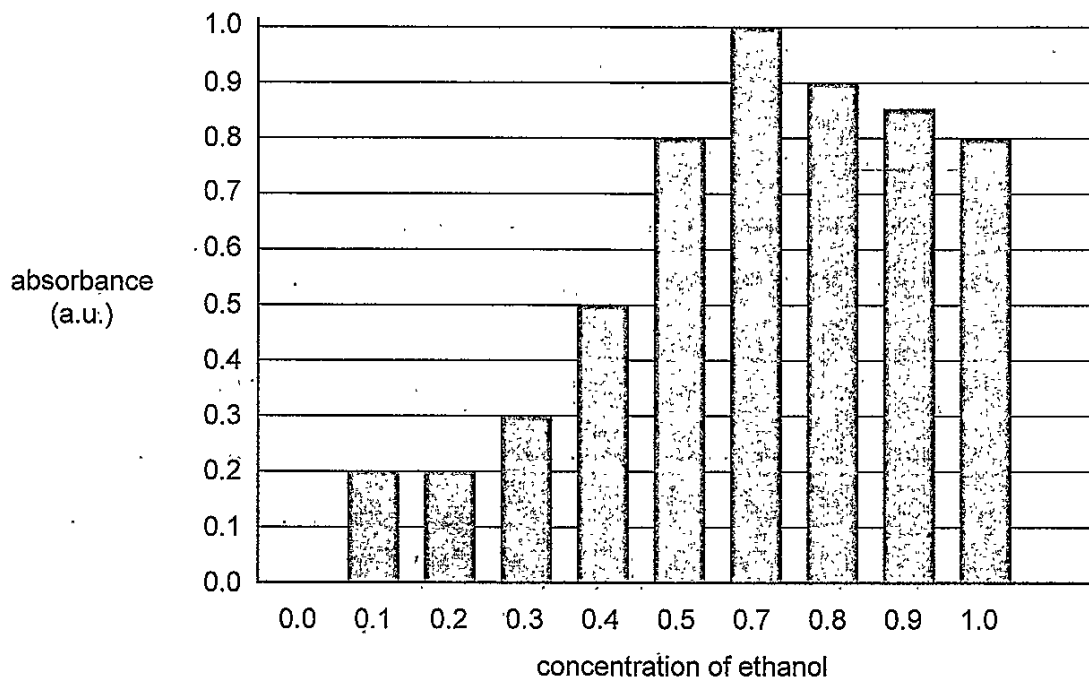


Fig. 20.1

(i) Make **three** criticisms of the way the student has displayed these results.

1 hasn't used units for concentration ✓

2 isn't titled, ✓ we don't know the context of the results

3 should have plotted a line graph ✓ it could be used to calculate the concentrations of unknown solutions ✓ [3]

(ii) Explain how carrying out replicates would improve this investigation.

you would be able to spot anomalies ✓ more easily. you would be able to find the mean ✓ the results to get more accurate results. you'd be able to reduce the effect of error. [2]



- 21 (a) The greater blue-ringed octopus, *Hapalochlaena lunulata*, is one of the most venomous of all animals.

Its bite contains tetrodotoxin (TTX), a neurotoxin that can cause paralysis and death within minutes.

- (i) The following information has been discovered about the effects of TTX on nerve cells:
- TTX binds to the external surface of the voltage-gated sodium ion channels in the axon membrane.
  - Binding of TTX changes the tertiary structure of the channel.
  - This means the channel cannot open.

Using the information provided, explain how TTX affects the activity of neurones.

When a stimulus is detected, the generator potential would be able to occur at first, but ~~it would be~~ when it triggers the opening of the voltage gated channels for an action potential, they would be unable to open, meaning an action potential would never occur, and so the activity of neurones would decrease a lot.

[4]

- action potential can't be reached



- (ii) A common cause of death from TTX poisoning is suffocation (not getting enough oxygen) as a result of paralysis of the diaphragm.

Explain how paralysis of the diaphragm could lead to suffocation.

the diaphragm would be unable to lift or ~~fall~~ relax in order to alter the pressure in the thorax.  you would therefore be unable to draw air in  or breathe it out. This means you would <sup>not</sup> get enough air, and ~~therefore~~ <sup>therefore</sup> not enough oxygen too.

- (iii) TTX is also known to reduce the speed of conduction in the Purkyne fibres of the heart.

Suggest and explain what effect this would have on the heart rate.

It would slow the heart rate  because the Purkyne fibres would be stimulated much more slowly. this means they would ~~contra~~ make the heart  contract much more slowly, slowing the heart rate down.

[3]

- (b) Molluscs such as *H. lunulata* have unmyelinated neurones. Saltatory conduction cannot occur in these neurones.

Why is transmission of action potentials along the axon slower in the absence of saltatory conduction?

It has to pass all the way along the axon, instead of being able to jump across.



22 (a) A scientist used a respirometer to investigate the rate of respiration and photosynthesis of maize in different light intensities.

- The scientist placed ten maize seedlings in a respirometer and kept it in the dark for three hours.
- The respirometer contained soda-lime to remove any  $\text{CO}_2$  produced by the seedlings.
- The scientist placed ten maize seedlings in a separate respirometer without soda-lime and placed it in different light intensities for three hours at a time.

Light intensity (lux)	Distance moved by fluid in respirometer (mm)
0	-3.7
1020	-0.8
1510	0.0
1700	1.2
2000	2.9

Table 22.1

(i) The diameter of the capillary tubing was 0.1 mm.

The volume of a cylinder can be calculated using the following formula:

$$\text{volume of cylinder} = \pi r^2 l$$

Calculate the **rate of oxygen uptake** by the seedlings in the dark. Give your answer to **two significant figures**. Show your working.

$$\pi r^2 l = \pi \times 0.05^2 \times 3.7$$

$$= 0.029 \text{ in 3 hours}$$

$$\frac{0.029}{3} = 9.68658 \times 10^{-3}$$

Answer = .....  $9.7 \times 10^{-3}$  .....  $\text{m}^3 \text{m}^{-1} \text{s}^{-1}$  [3]

(ii) 1700 lux is a typical light intensity on a cloudy day in the UK. Calculate the percentage increase in gas production between 1700 and 2000 lux. Show your working.

$$1700 = 1.2$$

$$2000 = 2.9$$

$$\frac{2.9 - 1.2}{1.2} = 1.7 \quad \frac{\text{diff}}{\text{original}}$$

$$\frac{1.7}{1.2} \times 100 = 141.6\%$$

$$\frac{2.9}{1.2} \times 100 = 241.6\%$$

Answer = ..... 141.6 ..... % [2]



- (iii) Suggest why soda-lime was **not** placed in the respirometer with the seedlings grown in the light.

to provide a control to compare and contrast because they need  $\text{CO}_2$  in order to photosynthesise. [1]

- (b) The scientist made the following claim:

These results suggest that, in maize seedlings, the rate of photosynthesis only exceeds the rate of respiration when the light intensity is above 1510 lux.

Use the data in Table 22.1 to explain why the scientist made this claim.

because at 1510, the rate of respiration = the rate of photosynthesis (not compensation). GM  
therefore above this light intensity he can see that <sup>air</sup> is being drawn up into the plant and therefore the rate of photosynthesis must be greater than the rate of respiration. [2]



23 (a) A student looked at slides of different tissues under a light microscope.

The four viewed images are labelled W, X, Y and Z in Fig. 23.1, on the insert.

Identify tissues W, X and Y.

W ... liver lobule

X ... islet of Langerhans

Y ... striated muscle

[3]

(b) The student wrote the following summary about the control of heart rate.

When the heart rate is too low the level of carboxylic acid in the blood becomes higher than normal. The vagus nerve sends action potentials to the AVN to increase the contraction rate of the heart muscle. The <sup>chemo</sup>baroreceptors in the walls of the blood vessels then detect that the pH of the blood is normal, so heart rate can return to resting normal.

The endocrine system can also change heart rate. Release of the hormone <sup>noradrenalin</sup> adrenaline from the adrenal medulla causes the <sup>cardiac</sup> smooth muscle of the heart to contract more frequently.

Identify and correct any biological errors in the student's summary.

- it's not baroreceptors that detect blood pH, it's <sup>chemo</sup>chemoreceptors.
- the heart rate ~~is~~ returns to normal, not resting.
- the endocrine system releases noradrenaline not adrenaline.
- it's not released from adrenal medulla, it's released from hypothalamus.
- there's cardiac muscle in the heart, not smooth.

[4]



(c) Reflex actions are rapid responses that protect the body from harm.

The Moro reflex is found in babies up to five months of age, and occurs when the baby feels its head is suddenly no longer supported. The Moro reflex is made up of the following responses:

- The baby spreads out its arms then brings them together rapidly.
- The baby cries.

(i) Suggest how the Moro reflex helps to prevent harm to a newborn baby.

by spreading its arms out and bringing them together, it's more likely it would be able to grab something, or be grabbed by something, to protect it from falling.

by crying, it draws attention to itself to alert those around it that could help. [2]

(ii) The Moro reflex gradually disappears and usually stops completely after babies reach nine months. Other reflexes develop as children grow older.

Describe a reflex response a 3-year-old child would make to an object moving towards their eyes and explain the advantage of this response.

the object moving towards the eye would be a stimulus, this would stimulate the receptor, which would be part of the eyelid. this triggers a nerve impulse that would travel along a sensory neurone to the central nervous system, where it would then be processed and a motor nerve impulse would be passed to the effector, which would be a muscle in the eyelid. This would contract, and close the eyelid. [3]

~~Stimulus → receptor → sensory → CNS → motor → effector → response.~~

The advantage to this response is that it protects the eyes from being harmed. It is also an unconscious action, so happens quickly, so it's a rapid response.





ADDITIONAL ANSWER SPACE

If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s).

Lined area for writing answers, featuring a vertical margin line on the left and horizontal dotted lines. A red 'BP' stamp is located in the center of the page.

BP



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