Marker's report for 2022 Prelim Paper 2

Section A

1 Fig. 1.1 shows a *Stentor*, a unicellular organism that lives in freshwater.

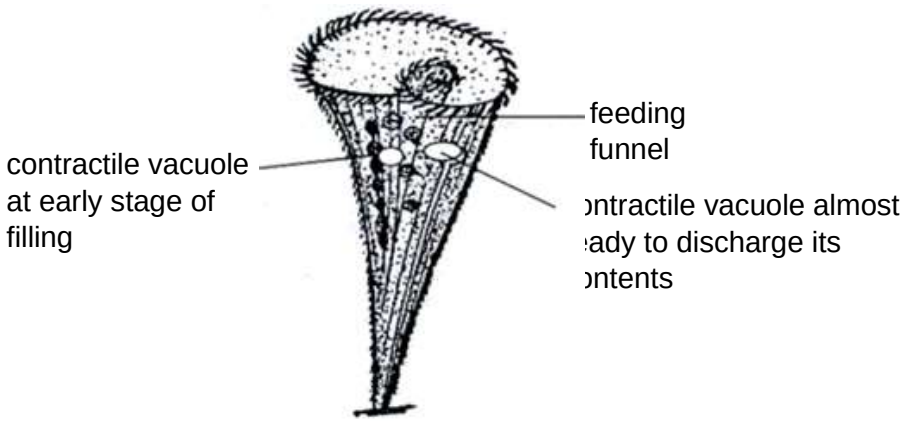


Fig. 1.1

Due to the difference in the concentration of salt inside the cell and the surrounding freshwater, the *Stentor* absorbs water from its surrounding, then discharges it by regular contractions of the contractile vacuole.

(a) Explain the process of how water enters the *Stentor*.

Water molecules enter the cell through <u>osmosis</u> by passing through the <u>partially permeable membrane</u> of the cell membrane;

The surrounding freshwater has a <u>higher water potential</u> than the water potential of the contractile vacuole / cytoplasm inside the cell;

[2]

Common errors were not stating partially permeable membrane in their answers and still using terms such as concentration gradient for movement of water.

Majority were able to distinguish between which region was of a higher or lower water potential.

(b) Explain the importance of controlling the water potential of the *Stentor* living in a freshwater environment.

The *Stentor* needs to maintain the water potential of water in it under control OR
If water potential of freshwater env. is too high, water molecules will enter the *Stentor;*

***Stentor* would expand/ swell and eventually <u>burst</u>;**

[2]

Some did not read the question carefully and gave answers of Stentor gaining and losing water. Many used terms such as flaccid/ plasmolysed/turgid to describe the Stentor but it is not a plant cell.

(c) The *Stentor* was taken from its freshwater habitat and placed in a saltwater aquarium.

Explain what will happen to the *Stentor* in the saltwater aquarium after 2 days.

Water molecules will move out of the cytoplasm of the *Stentor* into the saltwater + by osmosis;

It would shrink / crenated (eventually dying).

.....

[2]

.....

Many gave answers such as Stentor dying without stating that it would shrink first, before proceeding to mention that it will die.

[Total: 6]

2 Certain fruits contain biological molecules that prevent the solidification of a protein-based jelly when it is cooled. Protein-based jelly exits in liquid state at high temperature but becomes solid when it is cooled.

An experiment was conducted to investigate the presence of these biological molecules in fruits.

The protein-based jelly was prepared by mixing jelly powder with warm water. The mixture was poured into 5 bowls each with different contents as shown in Fig. 2.1. The bowls were left in the refrigerator to chill for 3 hours.

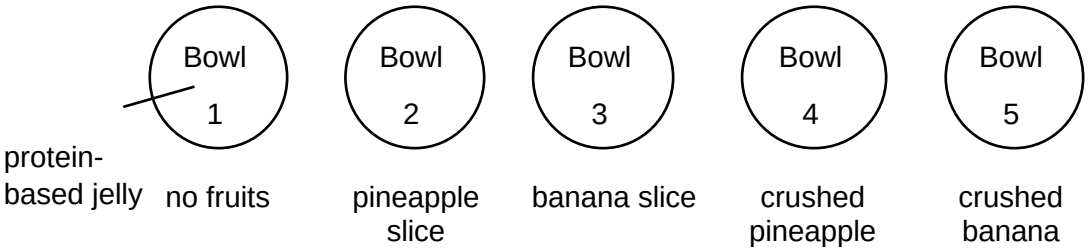


Fig. 2.1

Table 2.1 shows the texture of the jelly after being chilled in the refrigerator for 3 hours.

Table 2.1

Bowl	texture of jelly
1	solid
2	semi-solid
3	solid
4	liquid
5	solid

(a) Explain the purpose of Bowl 1.

Bowl 1 is a control set up to show that the fruits contains a biological molecule / enzyme that prevented the jelly from solidifying.

Most could not go beyond saying that it serves as a control setup / expt.

you need to say that it shows that something in the fruits prevented the solidifying. Control = without the treatment (no fruits)

Experimental = with treatment (with fruits)

(b) Explain the observation for the different textures of jelly between Bowls 2 and 4.

SAV Crushing the pineapple increased the surface area to volume ratio / More exposed surface area between the crushed pineapple and jelly ;

R This increased the rate of diffusion of the biological molecule out of the fruit ;

Many could not relate the increased rate of diffusion of the molecules out of the crushed pineapple. They jumped from increased SA/vol ratio to the inability to solidify

[2]

(c) The jelly powder used in this experiment is made up of fibrous proteins in the form of long-chain polypeptides.

An analysis of the proteins in Bowl 2 shows that it contains a mixture of polypeptides of 2 different lengths. 50% of the polypeptides are of the original length, and the other 50% of polypeptides are one-third of the original length.

(i) Explain the presence of 50% of polypeptides which are one-third of the original length.

The enzymes / protease in pineapple digested the polypeptide. ;

need to use the correct terms - digest or break down

some lost the mark by not being able to identify the biological molecules as enzymes or protease

(ii) Describe the analysis of the proteins in Bowl 4.

Bowl 4 contains more than 50% of the shorter polypeptide / 1/3 length of original polypeptide;

(Reject: polypeptides shorter than 1/3 of original length)

Most said it is 100%. In fact it can be between 51 - 100%.

(d) State the conclusion that can be made from the results of Bowls 1, 2 and 3 in Table 2.1.

Pineapple contains an enzyme / protease that prevented the jelly from fully solidifying, while lacking in bananas

Mostly correct. Some reversed the conclusion (banana contains the enzyme that enabled solidifying.

Determine the aim of the experiment to get the correct conclusion.

[Total: 6]

3 An experiment was conducted to investigate the effect of different colours of light on the rate of photosynthesis.

Fig. 3.1 shows the set up for the experiment.

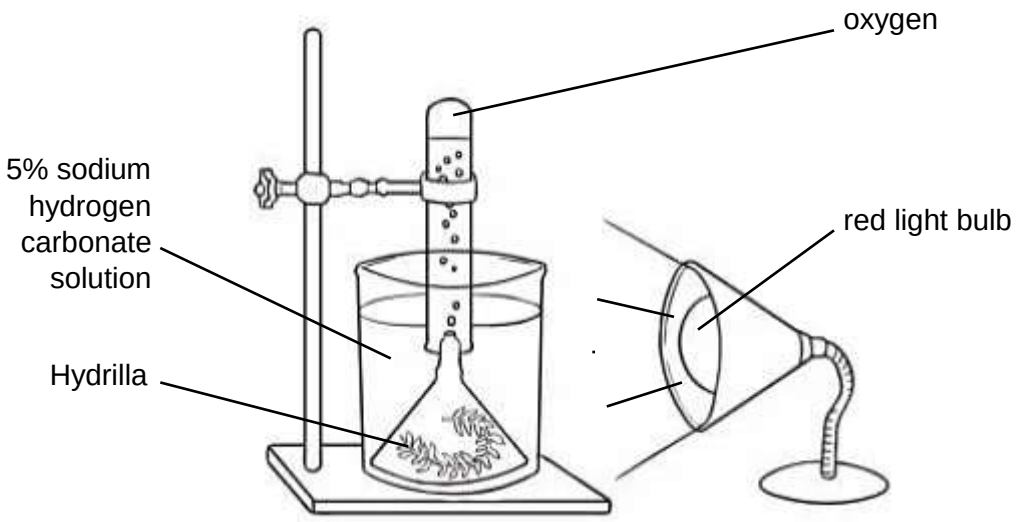


Fig. 3.1

A healthy stalk of Hydrilla was placed in a beaker of 5% sodium hydrogen carbonate solution. A light bulb giving out red light was used, and volume of oxygen collected over five minutes was recorded.

The experiment was repeated using light bulbs giving out green, blue, and yellow light. All light bulbs used are of the same power. The results are presented in Table 3.1.

Table 3.1

colour of light bulb	volume of oxygen collected in 5 minutes / cm^3
red	4.8
green	1.2
blue	4.2
yellow	2.0

(a) Write the balanced chemical equation for photosynthesis.
Many did not include the conditions

light
$6CO_2 + 12H_2O \rightarrow C_6H_{12}O_6 + 6O_2 + 6H_2O$
chlorophyll

[1]

(b) Algae are aquatic micro-organisms that are capable of photosynthesis. They grow quickly in a fish tank and stick to the side of the tank, making it difficult to see the fish.

(i) Based on the results of the experiment, state the colour of light that would best be used to minimise the growth of algae.

Green Colour [1] Almost all got this correct

(ii) Explain your choice of colour.

the rate of photosynthesis is the lowest / slowest leading to the slowest growth rate) at this colour / green colour

Mostly correct - need to link the smallest volume of oxygen to the rate of photosynthesis

[1]

(c) The rate of photosynthesis is affected by the colour of light. The colour of light is a limiting factor.

Using the colour of light, explain the term *limiting factor*. **Very badly answered**

The rate of photosynthesis will increase or decrease when there is a change in the colour of light used.;

OR A specific coloured light / (wavelength of the light) will either increase or decrease the rate of photosynthesis;

Try to remember this:

1) **when the factor (IV) (eg temp, light intensity, concentration) is changed,**
2) **the rate of photosynthesis / digestion / diffusion (DV) etc will also be changed**
3) **what is the change like?? increased? decreased? increased or decreased depending on the factor (as in this question)**
4) **so usually factor increased, rate increased OR factor increased, rate decreased**

(d) Discuss the advantage of using 5% sodium hydrogen carbonate solution instead of distilled water in this experiment.

The amount of dissolved carbon dioxide will be higher than in distilled water ;

So that the concentration of carbon dioxide is not a limiting factor in this set up ;

OR increased the rate of photosynthesis

The hydrogen carbonate solution has been used in some of the photosynthesis experiments. Those who did not remember cannot answer this question well.

(e) Describe a suitable control set up for this experiment.
No light used / absence of light ;
R: white light since it contains all colours of light / normal light bulb
common mistake is to use WHITE light, or no-colour light (??)

[Total: 7]

4 Fig. 4.1 shows a heart at two different stages.

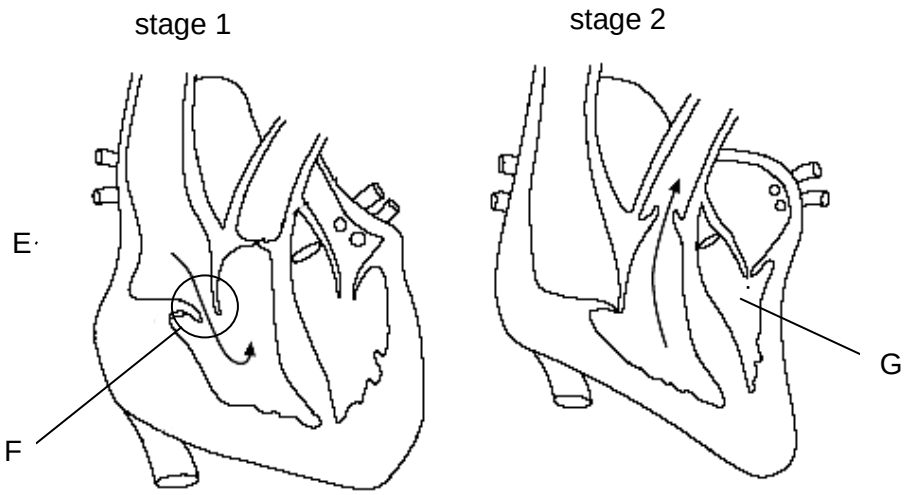


Fig. 4.1

(a) Name the labelled parts E and F.

E: **Right atrium**

F: **Tricuspid valve** **[2]**

well answered (need to memorise the parts and functions of the heart)

(b) With reference to Fig. 4.1, describe the events which cause the blood to pass through the heart in the direction of the arrows from stage 1 to stage 2.

AC Muscles of right atrium contracts to force the blood into the right ventricle by forcing open the tricuspid valve. ;

VC Muscles of right ventricle contracts and forces blood into the pulmonary artery/through pulmonary arch by forcing open the semi-lunar valves. ;

TC Tricuspid valve closes to prevent the backflow of blood into the right atrium ;

most could get at least 2m. Need to be complete in the answer.

many did not mention the 3rd point - it also contribute to the direction of blood flow according to the arrow.

(c) Fig. 4.2 shows the changes in pressure in the left side of the heart during the cardiac cycle.

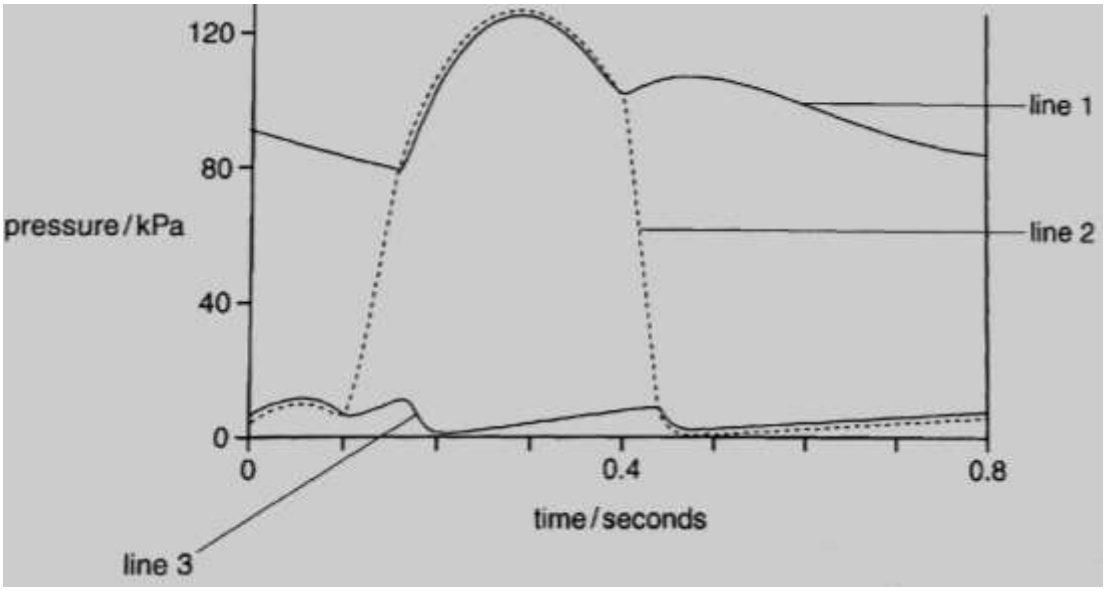


Fig. 4.2

(i) State the line number on Fig. 4.2 that corresponds to the part labelled G in Fig. 4.1.

Line 2 [1]

(ii) Based on Fig. 4.2, estimate the duration of ventricular systole of the heart.

0.4 - 0.1s = 0.3s [1]

common error is 0.35s

ventricle contracts - bicuspid valve closes (at 0.1s) blood pressure increases

ventricle relaxes - SL valve closes (at 0.4s) to prevent backflow of blood

[Total: 7]

5 Table 5.1 shows the medical conditions of the kidney and liver functions of three monkeys.

Table 5.1

monkey	kidney	liver
1	functional	functional
2	functional	non-functional
3	non-functional	functional

Fig. 5.1 shows the blood urea concentration of the three monkeys over a period of 24 hours.

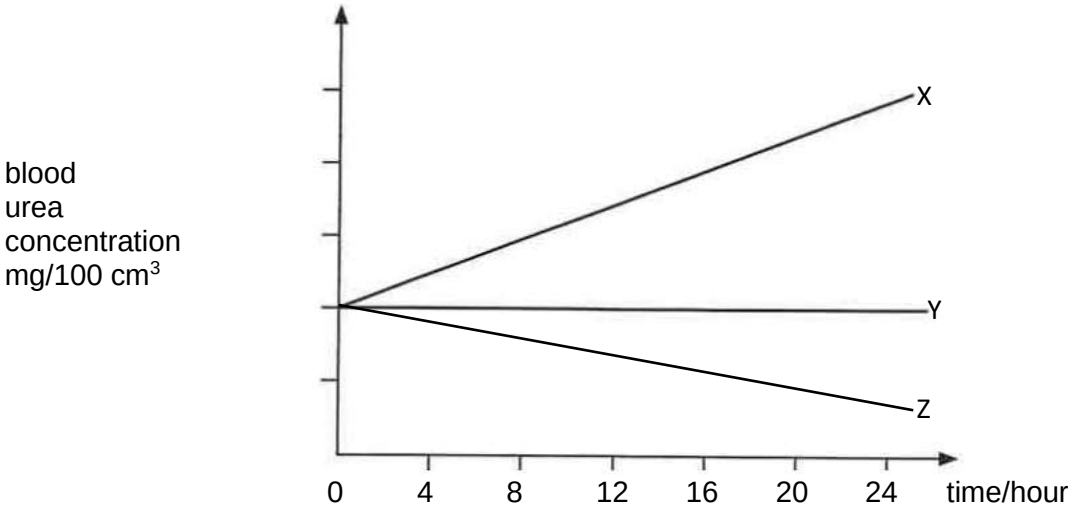


Fig. 5.1

(a) Identify which line from Fig. 5.1 corresponds to monkey 3 that has a non-functional kidney but functional liver?

Explain your answer.

X ;

Explain: A non-functional kidney will not be able to remove urea from the blood plasma. ;

mostly correct

should answer the qn directly. Some would describe the functional kidney removes urea instead of saying a non-functional kidney is unable to.

(b) Describe how urea in the blood enters the nephrons and is removed through the renal pelvis.

DP The diameter of the lumen of the afferent arteriole is larger than the efferent arteriole. + This generate a high hydrostatic pressure at the glomerulus. ; most could not get this mark

UF Urea is forced through the glomerulus wall and basement membrane by ultra-filtration ; and some lost this mark as the glomerulus / ultrafitration is omitted

C are collected in the bowman's capsule and collecting duct. ;

[3]

[Total: 5]

6 Read the passage below, and answer the following questions based on the information from the passage and your knowledge of Nervous System and Hormones.

Adam was alone in the classroom reading a novel. Upon hearing the fire alarm, he sprinted out of the classroom to the car park. When he reached there, he was trembling and his heart rate was 160 bpm (beats per minute). He managed to calm himself down 5 minutes later.

(a) **(i)** Fig. 6.1 shows the pathway between the stimulus and Adam's response.

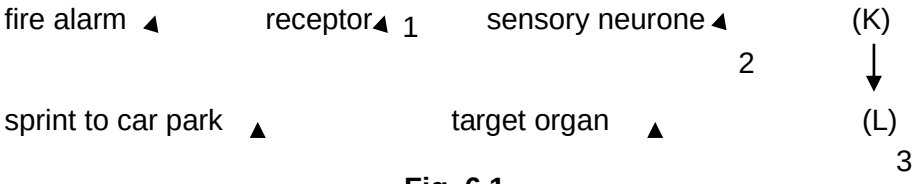


Fig. 6.1

This pathway passes through K and L which are tissues or organs associated with the nervous system. 4

Identify K and L.

K: Hypothalamus ;most could not this correct

L: adrenal gland ; many correct

[2]

(ii) The message transmitted through the pathway in Fig. 6.1 is either electrical or chemical in nature. Identify the nature of this message using the numbers 1 to 4.

electrical signal: **1,2 and 3**
chemical signal: **4** [2]

mostly incorrect, attributed to the wrong answers for K and L

(b) **(i)** Adam's heart rate increased to 160 bpm during his sprint to the car park after hearing the fire alarm.

Suggest another body response not mentioned in the passage that occurs as a result of the stimulus.

Increased breathing rate to increase uptake of oxygen ; OR
Increased conversion of glycogen in liver & muscles into glucose ;
mostly correct, some mentioned dilated pupil to (ii) see better so he could run faster (though this answer is of a lower quality)

(ii) Explain how this response in **(b)(i)**, together with his increased heart rate, helped Adam to sprint to the car park.

Her increased heart rate will pump blood at a faster rate to supply more oxygen ; OR
glucose to her muscles to enable her to sprint;

some could not link the increased rate of breathing to the increased heat rate

(c) Adam's response to the fire alarm is NOT a reflex action.

Give one reason for this statement.

Adel can choose (use of conscious will) to remain in the classroom or to sprint to the car park.;

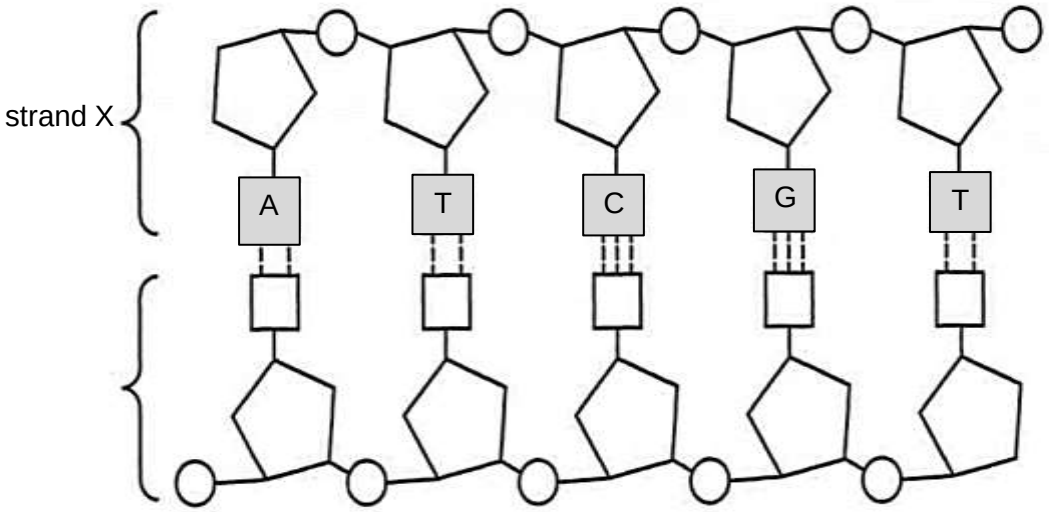
mostly correct by saying it is a voluntary action / it is a decision etc

some lost the mark thinking that a reflex action has to be felt (by touch) but the pupil reflex is due to bright lights

[1]

[Total: 7]

7 Fig. 7.1 shows parts of two strands of DNA.



(a) The letters A, C, G and T in strand X represent the four bases found in DNA. There is complementary base pairing between strand X and Y.

Complete Fig. 7.1 by adding the letters of the complementary bases in the unshaded boxes in strand Y.

Well answered. Most students are very familiar with complementary base pairing with only a few students who used Uracil in the DNA strand.

Students need to understand that Uracil is a nitrogenous base found only in RNA molecule.

(b) When describing the structure of chromosomes, we usually refer to genes and DNA.

Describe the **relationship** between genes, chromosomes and DNA.

DNA (Deoxyribonucleic acid):
It is a molecule made out of 2 strands of polynucleotides that are tied together by hydrogen bonds and twisted into a double helix and codes for a specific polypeptide. [1]

Genes:
A gene is a hereditary unit consists of a sequence of DNA that occupies a specific location on the chromosome and the function of the gene is to control the production of ONE protein/polypeptide. [1]

Chromosome:
Is a threadlike structure consists of many sequence of genes that determines a characteristic of an organism.[1]

.....

[3]

.....

Very poorly answered. Students are unfamiliar with the demands of the question stating the "relationship" between the 3 terms. Many students are just defining or stating each term with no regards to relationships between DNA, Gene and chromosome.

A large number of students are unable to describe each of the terms accurately. Many misconceptions are observed in the answers.

Eg: There are many chromosomes in the DNA.

(c) Thalassemia is an inherited blood disorder that occurs when there is a defect in the haemoglobin protein molecule in red blood cells. It is inherited as a recessive allele and results in an abnormal form of haemoglobin.

Suggest how this defect may have come about and explain how this results in an abnormal form of haemoglobin.

This defect could have been brought about by (random) gene mutations ;

This mutation results in a change in the DNA nucleotide sequence, leading to + change in the polypeptide chain affecting the haemoglobin molecule formed.

.....

[2]

.....

[Total: 6]

Very poorly answered. Many students misunderstood the question and went to explain how the hereditary condition comes about. Majority of the students wrote about the parents being of heterozygous genotype and how each parent contributes a recessive allele to the child causing the child to have sickle-cell anaemia.

Students MUST take note of how the defect come about, what was the original cause of the defect of sickle cell anaemia.

A number of students who understand the demands of the question did not state the exact mutation, instead students have the tendency to give generalised statements such as defining what is a mutation, and mutation consists of a sudden/random change in the structure of DNA or the structure and number of chromosomes. Students are not aware that there is a difference between chromosomal mutation and gene mutation.

These students are not awarded any marks.

8 Maple Syrup Urine Disease (MSUD) is an inherited metabolic disorder resulting from a defect in an enzyme involved in the breakdown of amino acids. It causes progressive

nerve degeneration and often results in death at an early age. The disease derives its name from the distinct burnt sugar (maple syrup) smell of the urine of an affected patient.

Affected babies appear normal at birth, but within four to seven days they begin to display distinct symptoms: lethargy, poor feeding and failure to thrive. These progresses to seizures, coma and death if untreated.

(a) MSUD is a condition caused by a recessive allele.

(i) **Key: Let M represents normal allele,**
Let m represents MUSD allele

Parents Phenotype: **normal X normal** — **1m**

Parents Genotype: **Dd X Dd**

Gametes: **D , d X D , d** — **1m**

F_1 Generation Genotypes: **DD Dd Dd dd**

F_1 Generation Phenotypes: **3 normal, 1 affected** — **1m**

Probability of a MSUD child = 0.25 / ¼ or 25% — **1m**

Deduct one mark if the gametes are not circled.

Many were not able to give a full genetic diagram, gave punnett square instead or had headings missing or wrote the wrong headings. There was confusion as to what is parental phenotype and genotype, and instead of stating that it is gametes, some wrote alleles

(ii) Identify the type of variation displayed by the condition of MSUD.

Discontinuous variation ;

[1]

Those who did not understand the question gave answers unrelated to variation. e.g. heterozygous or stated genotypes.

(b) Predict the probability of a child inheriting the disease if one of the parent is a carrier and the other does not have MSUD.

0% [1]

[Total: 6]

Name : _____

Class	Index Number

Section B

Answer **three** questions.

Question 11 is in the form of an **Either/ Or** question.

Only one part should be answered.

[continued overleaf…]

9 An investigation was carried out to study the effect of physical activity on breathing. The breathing rate (number of breaths per minute) of a student was measured at rest. The

student then cycled at a speed of 10 km/h for 2 minutes and her breathing rate was measured immediately after.

She then rested for five minutes before cycling at 15 km/h for 2 minutes. Her breathing rate was measured again.

This investigation was repeated for cycling speeds of 20 km/h and 25 km/h.
The results are shown in Table 9.1.

Table 9.1

cycling speed / km per hour	breathing rate / number of breaths per minute
0	6
10	8
15	12
20	17
25	29

(a) **(i)** Plot the data onto the grid in Fig. 9.1.

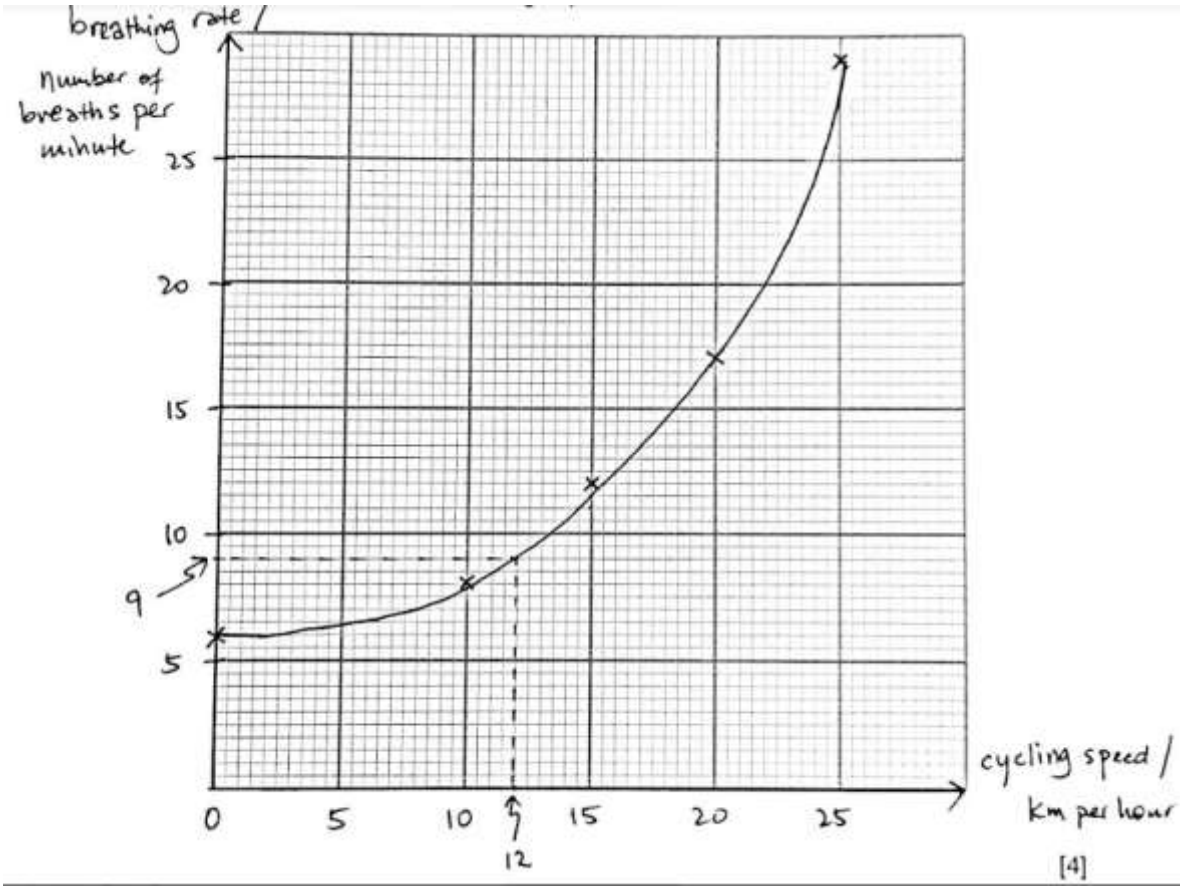


Fig. 9.1

[4]

- **Axes Labelled including units [1]**
- **Scale – suitable – fills more than ½ the space available [1]**
- **Points- points plotted correctly (allow 2 wrongly plotted points) [1]**

- **Best fit line [1]**

Question was well answered. some exceptions of wrongly plotted points or axes labelled the other way around.

(ii) Determine the breathing rate of the cyclist at 12 km per hour.
9 breaths per min
Accept 8.5-9.5 breaths per min

[1]

Marks awarded based on how it was determined from the graph, a few did not show on the graph. (BOD given when marking checked against their graph to ensure its correct). Quite a number didnt give units.

(b) **(i)** With reference to the graph in Fig. 9.1, describe the relationship between cycling speed and breathing rate.

As cycling speed increases from 0 to 10km/h, breathing rate gradually increases from 12-14 breaths per min. ;

At cycling speeds of 10-25km/h, breathing rate increases much faster from 14-27 breaths per min. ;

[2]

Question not well answered. Majority were not able to identify the trend that breathing rate increase gradually, then much faster after that. Many simply stated the linear increment of breathing rate with respect to cycling speeds, and DID NOT provide data.

(ii) Suggest an explanation for this relationship in **(b)(i)**.
When cycling speed increases, more energy is required [1]
Respiration rate increases to release more energy to meet demand [1]
Increase in breathing rate as more oxygen is taken in for respiration

When cycling speed increases, more energy is required ;
Respiration rate increases to release more energy to meet demand;
Increase in breathing rate as more oxygen is taken in for respiration;

[3]

Majority were able to give the 1st and 3rd points but not the second point.

[Total: 10]

10 Fig. 10.1 shows the effect of different blood alcohol concentration on a person's reaction time.

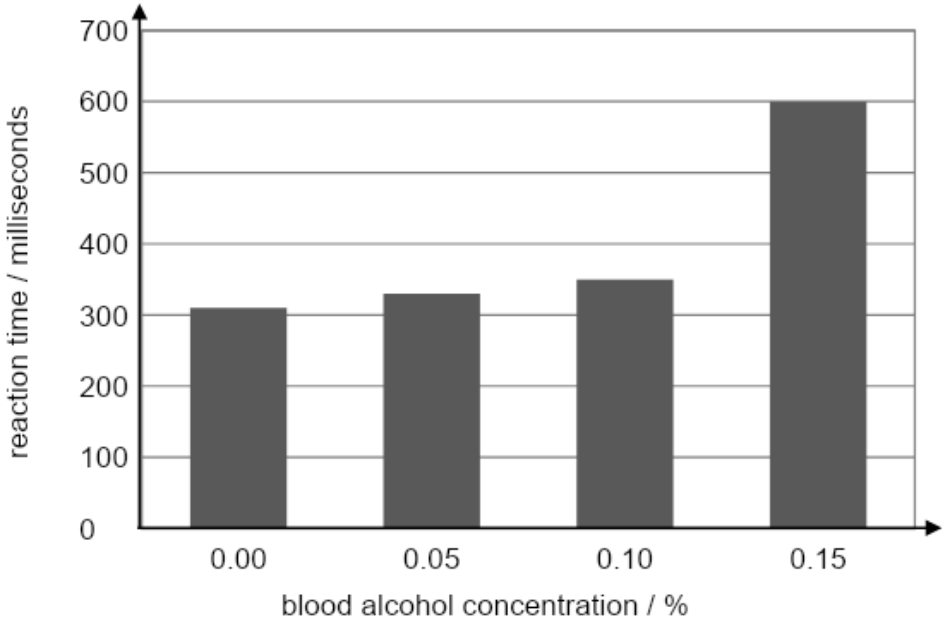


Fig. 10.1

(a) **(i)** With reference to Fig. 10.1, describe the effects of alcohol consumption on driving.

The higher the blood alcohol concentration, the slower the reaction time.

A person with 0.15% blood alcohol concentration is likely to react 300 milliseconds slower than a person whose blood alcohol concentration is 0.00%.

[Accept any relevant quotation of data. No marks awarded if no data from Fig. 7.1 is quoted]

~~**Alcohol consumption results in blurred vision, which causes a person to misjudge objects in front of them during activity.**~~

It can also result in poor muscular co-ordination, which causes a person to have slower reaction time during activity. **Alcohol consumption results in blurred vision, which causes a person to misjudge objects in front of them during activity.**

OR

Poor judgement of distance

[4]

Some did not provide data from the bar chart or provided data for either blood alcohol conc or reaction time, and not both.

marks awarded for being able to state the action not done by drunk driver e.g. cannot step on brakes in time

(a) **(ii)** State **two** long term effects of excessive alcohol consumption on the health of an individual.

Liver cirrhosis,
Gastric ulcers

[2]

Well answered for stating liver cirrhosis and marks awarded even for liver damage. A range of answers were given and accepted e.g. brain, kidney damage,heart disease, stroke.

Addiction/depression was not accepted. Depression is one which leads to drinking rather than the opposite.

(b) The liver is involved in carbohydrate metabolism.

Describe the role of the liver during fasting, and breaking fast with a meal rich in carbohydrates.

Period of fasting:
Glucose level in blood low/ lower than normal, pancreas stimulated to secrete more glucagon ;

Glucagon stimulates liver to convert stored glycogen to glucose ;
Diffuse into blood stream ;

After breaking fast with a meal rich in carbohydrates:
Glucose level in blood rises/ rises above normal, pancreas secretes more insulin into bloodstream ;

Insulin stimulates liver to convert excess glucose into glycogen which is stored in liver and muscles;

Maximum: 4 points from the above

[4]

Some common mistakes included not mentioning blood glucose levels increase or decrease after breaking fast and fasting respectively, mixing up glucagon and glycogen, not mentioning 'excess' for glucose when glucose is converted to glycogen.

Some even mentioned that the hormones are produced in the liver.

11 EITHER

Fig. 11.1 shows part of the carbon cycle.

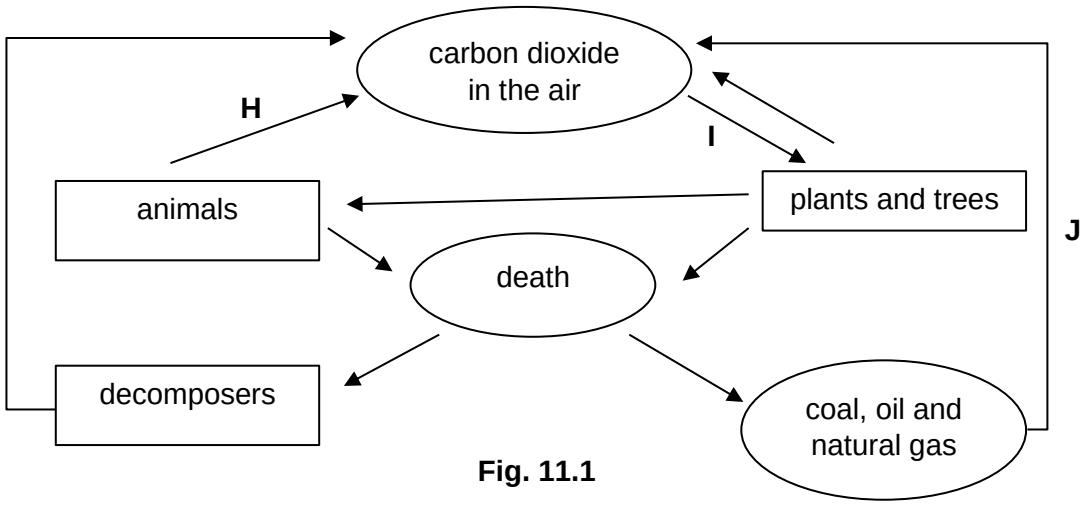


Fig. 11.1

(a) **Name processes H, I and J and explain how each one affects the concentration of carbon dioxide in the atmosphere.**

In your answers, identify **two** carbon sinks and use the information in Fig. 11.1 to support your answer.

H: respiration of living organisms (producers and consumers) releases carbon dioxide into the air and + increases the carbon dioxide concentration into the atmosphere.

I: Photosynthesis removes carbon dioxide from the air and hence + reduced carbon dioxide concentration in the air.

J: Combustion of fossil fuels releases carbon dioxide into the air and hence + increase the concentration of carbon dioxide in the atmosphere.

Carbon sinks:
Fossil fuels (coal/oil/natural gas) buried deep underground

Plants and trees in forests store carbon in the form of cellulose in cell walls and starch in leaves are rich sources of carbon sink.

[5]

Most students are able to name processes H, I and J, but a number did not comment on how these processes affect the carbon dioxide concentration. A number of students lack examination skills in relating these process to Carbon dioxide concentration, students merely define what is respiration, photosynthesis and combustion of fossil fuels.

A huge number of students are not aware how the forest functions as a carbon sink. The most common error students made is thinking that because plants take in carbon

dioxide and therefore that makes it a carbon sink. Students do not have the understanding that carbon is store in every part of the producers (in the cellulose cell walls, carbon stored as starch in leaves).

Many students also put down oceans as carbon sink, but the question requires with reference to Fig. 11.1, there is no mentioned of ocean in Fig 11.1

(b) Discuss ways to create a balance between timber production and conservation of the ecosystem.

Governments can also institute and enforce laws disallowing trees below a certain height from being cut down.

Reforestation efforts can be made to replant and replenish trees that have been cut down for timber.

Alternating areas of forests that can be cut down so there is sufficient time for parts of the forest to regrow naturally.

Designating certain parts of the forest as conservation areas / national parks where the trees cannot be cut down for any commercial purposes.

OR Planting of fast growing plants for use of timber Eg: pine tree

Having alternative source of timber, Eg: rubber wood.

.....

[5]

.....

Well answered with majority of the students able to provide realistic actions to balance between cutting down trees for timber and conservation of the ecosystem.

There is a small group of students who completely did not understand the demands of the question and went on to describe about the harmful effects of deforestation and how it affects the ecosystem through global warming, floods, etc.

[Total: 10]

OR

Fig. 11.2 shows how the thickness of uterus lining and the concentration of hormones in the blood change during a women's menstrual cycle.

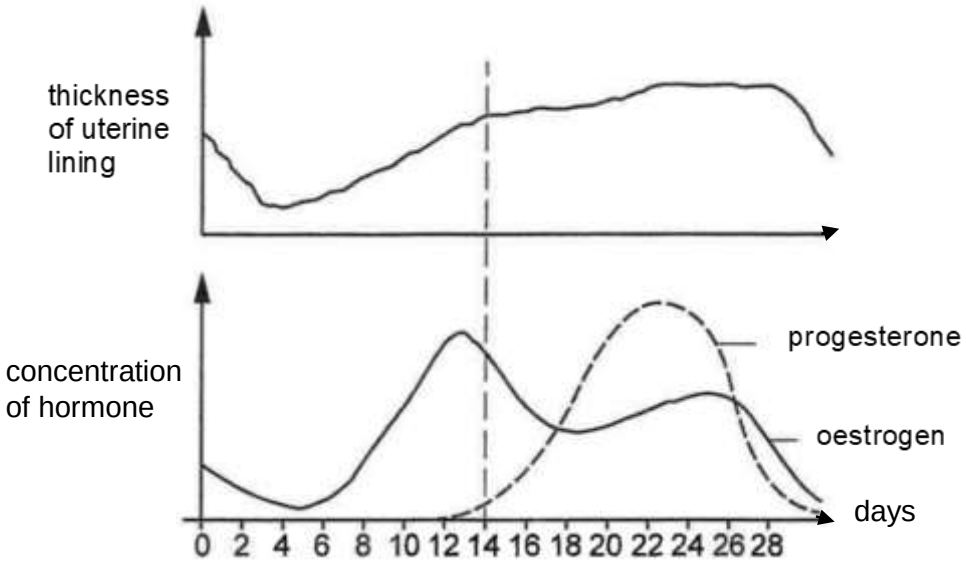


Fig. 11.2

(a) With reference to Fig. 11.2, describe how the changes in the concentration of the two hormones affects the thickness of the uterine lining from day 0 to day 28.

From day 0 to day 3, oestrogen and progesterone concentrations are low, this causes the thickness of the uterine lining to decrease during menstruation.

From day 3 to day 12, oestrogen concentration increases and the thickness of the uterine lining also increases.

From Day 12 to Day 22, progesterone concentration increases while the oestrogen concentration decreases.Uterine lining continues to thicken / progesterone helps to maintain the thickening.

From day 22 to day 28, oestrogen and progesterone concentrations start to decreases. Uterine lining remains thick and then drops quickly at day 28.

.....

[4]

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Many students disregard the question demand " With reference to Fig 11.2" and they did not state the time period. Any questions having " With reference to Fig, diagram, table" students must quote data in your answer. There are also a handful of students who did not describe the effect on the thickness of uterine lining, some stuents use term such as the uterine lining breaks down (with no indication of thickness).

The most common error every student made is between day 24 to day 28, where oestrogen and progesterone levels are decreasing causes the

uterine lining to decrease in its thickness too. This is not true, not reflected in Fig. 11.2.

Only after day 28, the thickness of the uterine lining decreases.

(b) Describe the process of fertilisation and outline the early development of the embryo into a fetus.

Fertilisation is the fusion of the nucleic of the egg and the sperm to form the zygote.

Zygote then undergoes a series of mitotic cell division / cell division to form a ball of cells known as the embryo.

Implantation of embryo into the uterine lining with the formation of embryonic villi

Formation of placenta for exchange of nutrients and oxygen into the fetus

And removal of urea and carbon dioxide from the fetus to the maternal blood stream

Formation of amniotic sac and amniotic fluid to protect the fetus from mechanical shock

Presence of umbilical blood vessels (umbilical artery to remove carbon dioxide and urea to maternal blood stream) / umbilical veins to transport oxygen and nutrients to the fetus.

Any 6 points from above

[6]

Many students describe the entire event leading to fertilisation which is unnecessary. Hence, students are not aware how to describe what is fertilisation.

A large number of students did not mentioned that the nucleus of the sperm fuses with the nucleus of the egg to form a zygote. some students have the tenddency to use the term fertilized egg instead of zygote.

A handful of students did not mentioned how zygote develop into an embryo by mitotic cell division / by mitosis. common misconceptions were by meiosis.

Some students used the term fertilized egg throughout their answers which is incorrect.

Students who only mentioned the term formation of placenta without elaboration on how placenta are formed or the roles of placenta were not awarded any marks.

[Total: 10]