

Visit
FREETESTPAPER.com
for more papers



Website: freetestpaper.com



[Facebook.com/freetestpaper](https://www.facebook.com/freetestpaper)



[Twitter.com/freetestpaper](https://www.twitter.com/freetestpaper)



TANGLIN SECONDARY SCHOOL

MID-YEAR EXAMINATION 2019

Secondary 2 Express

NAME

CLASS

INDEX NO.

GENERAL SCIENCE

Section A

1 hour 30 minutes
(Sections A, B and C)

Candidates answer on the OAS Paper.

Additional Materials: OAS Paper.

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.

Write your name, class and index number on the question paper.

Do not use staples, paper clips, highlighters, glue or correction fluid.

Section A

There are **30** questions on this paper. Answer **all** questions.

For each question, there are four possible answers, **A, B, C** and **D**.

Choose the **one** you consider correct and record your choice with a **soft pencil** in the OAS paper provided.

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.

Any rough working should be done in this booklet.

The use of an approved scientific calculator is expected, where appropriate.

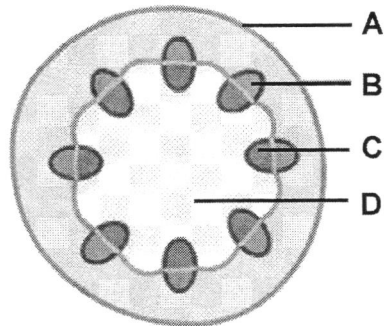
For Examiner's Use	
Section A	/ 30
Section B	/ 30
Section C	/ 20
Total	/ 80

This document consists of **11** printed pages and **1** blank page.

Section A

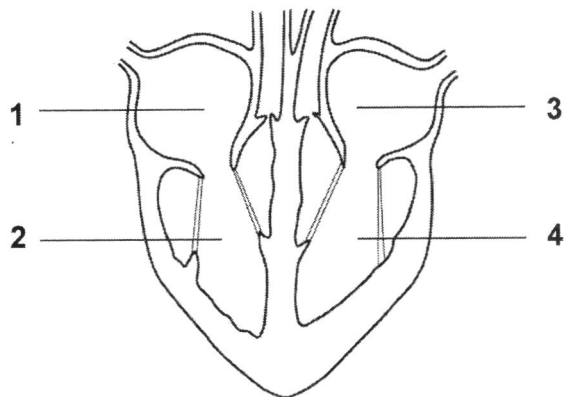
Answer **all** the questions in this section.

1. The diagram shows the cross-section of a stem.



Which part of the stem transports dissolved food substances?

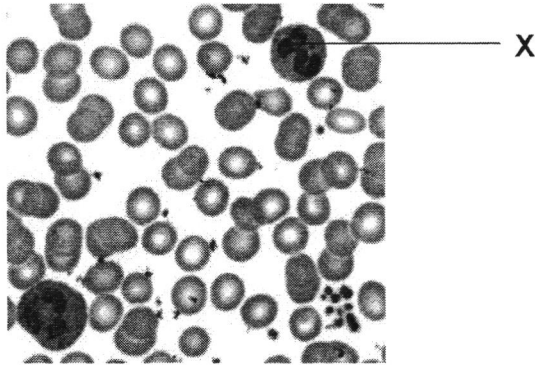
2. The diagram shows a section of a heart.



Which two chambers of the heart contain oxygenated blood?

- A. 1 and 2
- B. 1 and 3
- C. 2 and 4
- D. 3 and 4

3. The photograph shows the components of blood seen under the microscope.

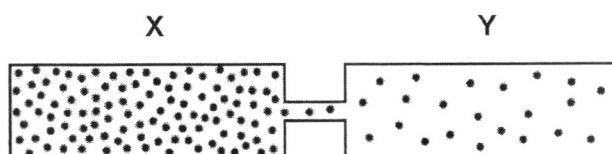


What is the function of the blood component labelled X?

- A. defence against foreign invaders
 - B. help to heal wounds
 - C. transporting dissolved substances
 - D. transporting oxygen
4. Which of the following examples best illustrates the process of diffusion?
- A. food moving through the oesophagus
 - B. plastic toy melting when heated
 - C. smell of freshly cooked popcorn filling the air
 - D. water droplets forming on a cold glass surface
5. What is the correct difference between diffusion and osmosis?

	diffusion	osmosis
A.	no specific substances involved	specific substances involved
B.	partially permeable membrane involved	no partially permeable membrane involved
C.	requires energy	doesn't require energy
D.	requires a difference in concentration	doesn't require a difference in concentration

6. The dots represent molecules of a gas in two chambers, **X** and **Y**, at the beginning of an experiment.



Which observation at the end of the experiment is correct?

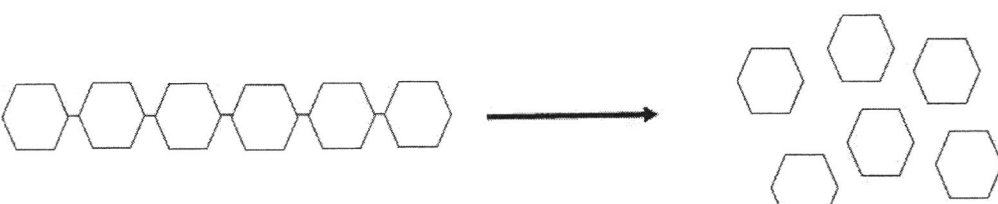
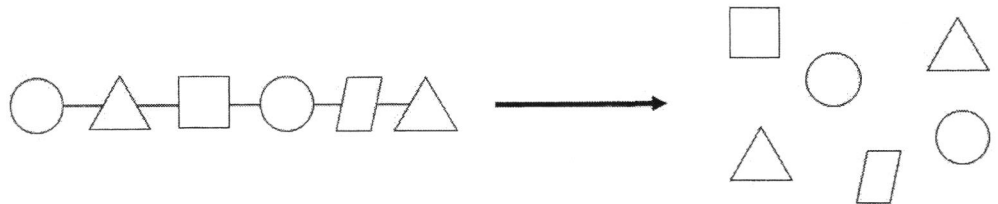
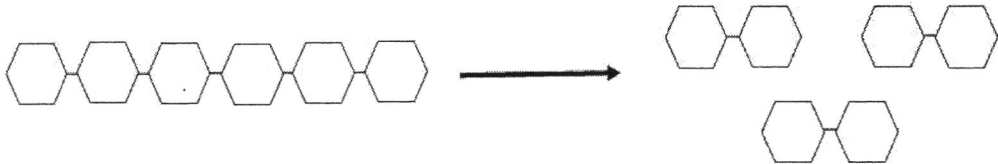
- A. There will be more gas molecules in **X** than in **Y**.
 - B. There will be more gas molecules in **Y** than in **X**.
 - C. There will be no change in the number of gas molecules in **X** and **Y** respectively.
 - D. The number of gas molecules in **X** and **Y** will be the same.
7. The table shows four foods, **A**, **B**, **C** and **D**, and their compositions in g per 100 g portion.

food	carbohydrate/g	fat/g	protein/g
A.	57.3	0.0	0.2
B.	3.8	42.6	22.5
C.	9.7	6.7	33.1
D.	0.0	2.5	10.4

Which food will provide the most energy immediately?

8. Which part of the digestive system does protein digestion mainly occur in?
- A. mouth only
 - B. mouth and small intestine
 - C. stomach and small intestine
 - D. stomach only

9. Which option shows the digestive action by salivary amylase, an enzyme found in the mouth?

A.	
B.	
C.	
D.	

10. Which is the end product of fats?

- A. amino acids
- B. glucose
- C. glycerol
- D. polypeptides

11. Which option about the functions of large intestine is correct?

- A. It absorbs both water and mineral salts.
- B. It does not absorb both water and mineral salts.
- C. It only absorbs mineral salts.
- D. It only absorbs water.

12. Which practice does **not** prevent food borne disease?

- A. cooked food kept at room temperature
- B. food is cooked at high temperatures
- C. hands thoroughly washed with soap
- D. separate knives for cutting raw food and cooked food

13. Which comparison between asexual and sexual reproduction is correct?

	asexual reproduction	sexual reproduction
A.	involves fertilisation	involves no fertilisation
B.	involves one parent	involves two parents
C.	happens in multicellular organisms	happens in unicellular organisms
D.	produces genetically dissimilar offspring	produces genetically identical offspring

14. Which physical trait is **not** due to heredity?

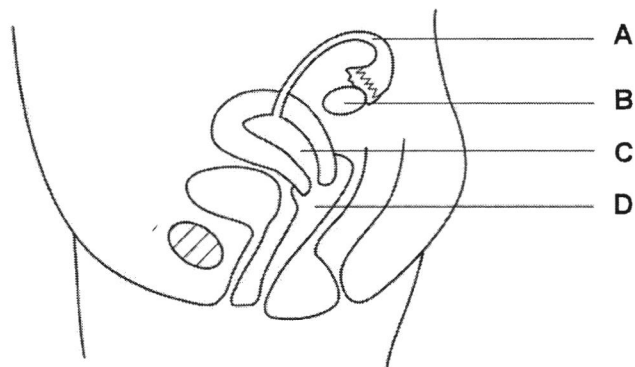
- A. dimples
- B. eye colour
- C. hairline
- D. muscular appearance

15. Which of the statement(s) about puberty is/are true?

- I. Boys and girls start puberty at the same age.
- II. Puberty lasts about two to five years.
- III. The emotions of young people change during puberty.

- A. I only
- B. I and II
- C. I and III
- D. II and III

16. The diagram shows the side view of the female reproductive system.



Where does implantation of embryo takes place?

17. Which STI(s) can be cured by antibiotics?

- A. AIDs only
- B. AIDs and gonorrhoea
- C. gonorrhoea and syphilis
- D. syphilis only

18. Which method does **not** cause the spread of HIV infection?

- A. casual sex
- B. sneezing
- C. transfusion of contaminated blood
- D. unsterilized piercing needles

19. A car travels for 100 km from 1000h to 1200h. it continues to travel the remaining 80km and reaches its destination at 1500h.

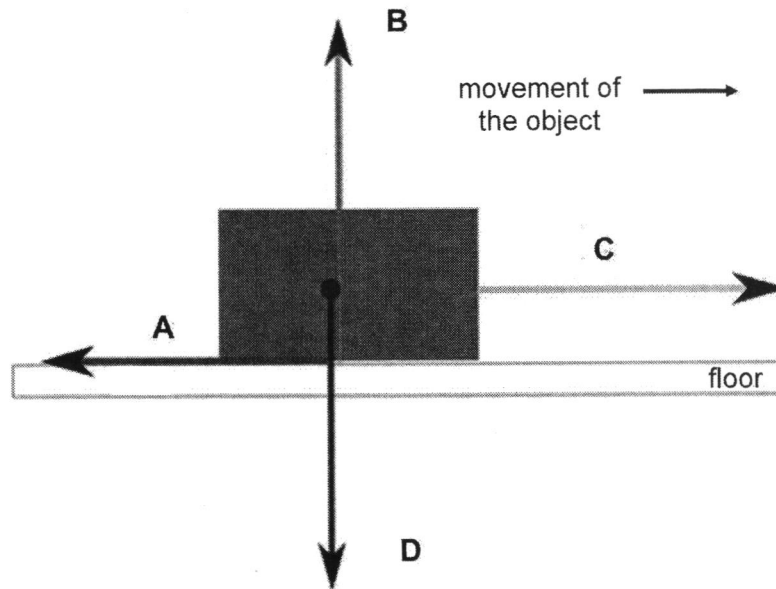
What is the average speed of the car?

- A. 30 km/h
- B. 36 km/h
- C. 40 km/h
- D. 46 km/h

20. Which option shows only non-contact forces?

- A. friction only
- B. friction and gravity
- C. friction and magnetism
- D. gravity and magnetism

21. The diagram shows the different forces acting on an object when it is being pushed across the floor.



Which arrow represents gravitational force?

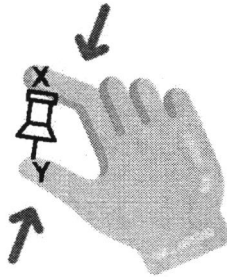
22. Which of the following method helps to increase friction?

- A. ball bearings in moving parts of machines
- B. car tyres with grooves
- C. lubricated surfaces
- D. streamlined shape

23. Which pairs of magnet would show a repulsive magnetic force?

A.	N S	N S
B.	S N	N S
C.	S N	S N
D.	N S S N	

24. The diagram shows a person holding a thumbtack in between his thumb and his forefinger. He felt a sharp pain on his thumb.



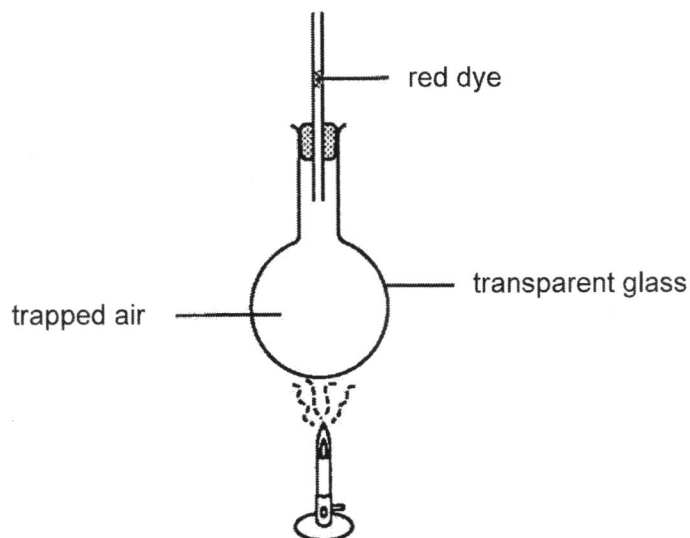
Which statement correctly explains his observations?

- A. Point X uses more force than Y to hold the thumbtack.
- B. Point Y uses more force than X to hold the thumbtack.
- C. The pressure of the thumbtack is greater on point X than Y.
- D. The pressure of the thumbtack is greater on point Y than X.

25. During cooling, how will the density and volume of a gas change?

	density	volume
A.	decreases	decreases
B.	decreases	increases
C.	increases	decreases
D.	increases	increases

26. What happens to the red dye in the tube if the apparatus shown is heated after 10 minutes?



- A. It immediately expands and moves down.
- B. It immediately expands and moves up.
- C. It moves down slightly before moving up.
- D. It moves up slightly before moving down.

27. What is the SI unit of temperature?

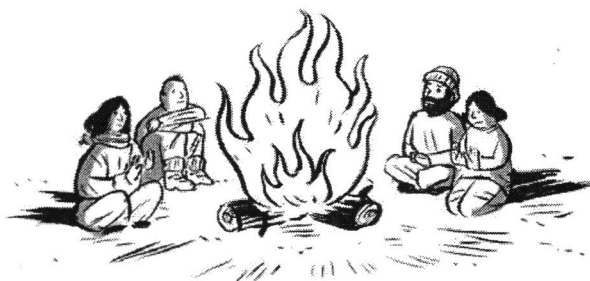
- A. degree Celsius
- B. Fahrenheit
- C. Kelvin
- D. Joules

28. Equal volumes of air, copper and water were heated through the same rise of temperature of 20°C .

Which option correctly shows the order of total time taken by air, copper and water to be heated?

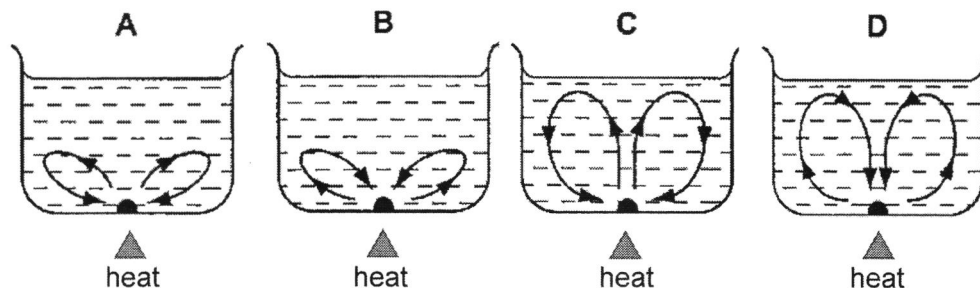
	longest time taken	→	shortest time taken
A.	air		copper
B.	copper		air
C.	copper		water
D.	air		water

29. The diagram shows a group of people sitting around a campfire.



Which is/are main method(s) of heat transfer to make a person feel the heat from the campfire?

- A. conduction only
 - B. conduction and radiation only
 - C. convection and radiation only
 - D. radiation only
30. Water in a beaker is heated from the bottom.



Which diagram best shows the convection currents?

END OF PAPER



TANGLIN SECONDARY SCHOOL

MID-YEAR EXAMINATION 2019

Secondary 2 Express

NAME

CLASS

INDEX NO.

GENERAL SCIENCE

Section B & C

1 hour 30 minutes
(Sections A, B and C)

Candidates answer on the Question Paper.

Additional Materials: NIL

READ THESE INSTRUCTIONS FIRST

Write your name, class and index number on all the work you hand in.
You may use a soft pencil for any diagrams, graphs, tables or rough working.
Write in dark blue or black pen.
Do not use staples, paper clips, highlighters, glue or correction fluid.

The use of an approved scientific calculator is expected, where appropriate.
You may lose marks if you do not show your working or if you do not use appropriate units.

Section B and C

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

The number of marks is given in brackets [] at the end of each question or part question.

For Examiner's Use	
Section B	/ 30
Section C	/ 20
Total	/ 50

This document consists of **10** printed pages.

Section B: 30 marks

Answer all the questions in the spaces provided.

1. Fig. 1.1 shows an experiment set up to investigate the partial permeability of Visking tubing.

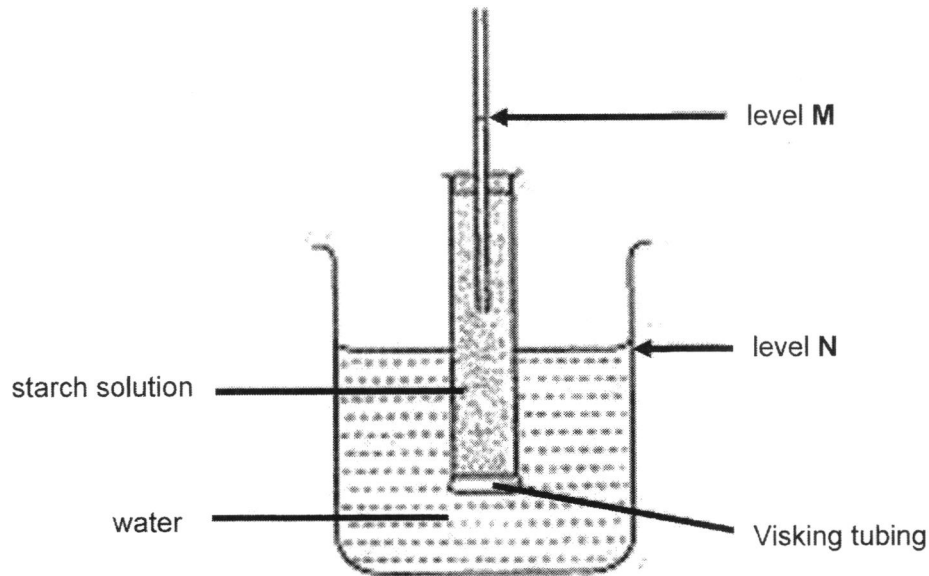


Fig. 1.1

- (a) Explain the term “partial permeability”.

..... [1]

- (b) After 15 minutes, there are changes that is observed to the liquid levels, **M** and **N**. State the changes observed to each level. [1]

Liquid level **M**:

Liquid level **N**:

- (c) Explain how the change in (b) takes place.

.....

 [2]

(d) Ten drops of iodine solution are added to the water in the beaker. After 5 minutes, the starch solution in the Visking tubing turned blue-black while the solution in the beaker remains yellow.

(i) Explain why the solution in the beaker remains yellow.

..... [1]

(ii) Explain how the iodine molecules move through the Visking tubing.

..... [2]

(e) Using the results of the experiment, deduce the conclusion of this experiment on the permeability of the Visking tubing.

..... [1]

[total: 8]

2. Pancreatic insufficiency is a disease that affects the pancreas's ability to produce sufficient enzymes and hormones. Fig. 2.1 shows how a healthy pancreas transports enzyme through the pancreatic duct to the small intestine.

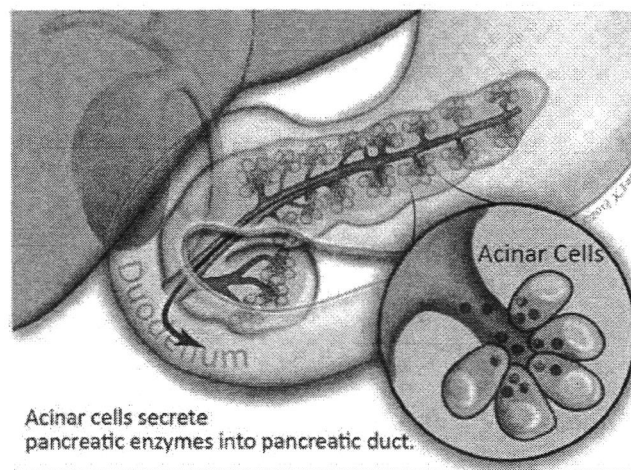


Fig 2.1

(a) State whether the pancreas is a part of the alimentary canal.

..... [1]

(b) Which type of nutrients are digested in the small intestine?

..... [2]

(c) One way to diagnose whether a patient has pancreatic insufficiency is through their stool content analysis. If his stools contain high fat content, the patient is likely to suffer from pancreatic insufficiency.

- (i) Describe what happens, if any, to fats from its entry into the mouth until it reaches the small intestine, in terms of digestion.

.....
.....
..... [3]

- (ii) Explain why fats are not supposed to be found in the stools, after the food substances passed through the small intestine and the large intestine.

.....
..... [2]

[total: 8]

3. There is a variety of birth control methods to help couples in their family planning.

(a) State two birth control methods in each category given in Table 3.1.

Table 3.1

	natural, temporary methods	artificial, temporary methods	permanent methods
1.			
2.			

[6]

(b) A newlywed couple wishes to have a family of their own, only after three years of marriage.

(i) State **one** birth control method that is most suitable for this couple.

..... [1]

(ii) Explain your choice in (b)(i).

.....

..... [1]

[total: 8]

4. The first astronauts, Neil Armstrong and Edwin “Buzz” Aldrin, who landed on the Moon in 1969, had planted their U.S. flag on the surface of the moon. They did a few experiments on their mass and weight. They found that their weight were $\frac{1}{6}$ of their weights on Earth. (Note: gravitational field strength, g , is 10 N/kg)

(a) Neil Armstrong’s mass is 78kg on Earth.

- (i) What would be Neil Armstrong’s mass on the Moon?

..... [1]

- (ii) Calculate his weight when he was on the Moon.

[2]

(b) The two astronauts had some difficulty poking the flagpole into the hard sub-surface soil of the Moon.

- (i) Suggest an improvement to the base of the flagpole to make it easier to push through the hard sub-surface.

..... [1]

- (ii) Explain how the suggestion in (b)(i) will help them, in terms of pressure.

.....

.....

..... [2]

[total: 6]

End of Section B

Section C: 20 marks

Answer all the questions in the spaces provided.

5. Fig. 5.1 shows the cross-section of the Magic Pot, sold by a household products company, which claimed that it will continuously slow cook your food from the residual heat for the next four to six hours after removing the heat source.

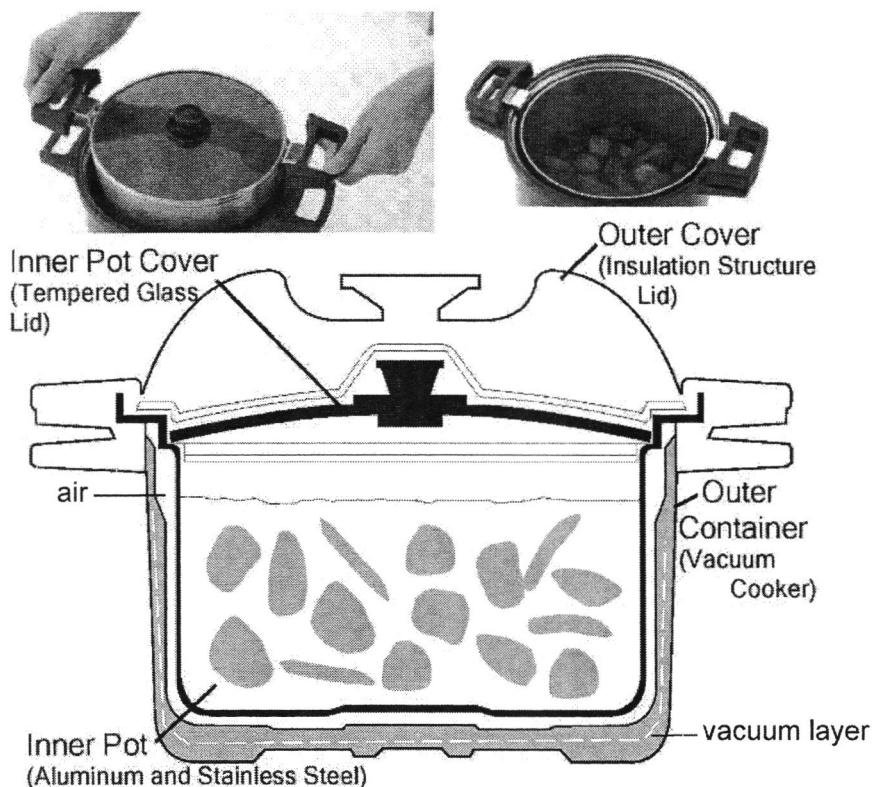


Fig. 5.1

Different parts of the Magic Pot are made up of different materials that affect heat transfer through conduction, convection and radiation.

- (a) The outer container has a vacuum layer, within the wall of the container.

- (i) Explain how heat transfer from the inner pot to the outer container is prevented.

.....

 [2]

- (ii) Explain how the vacuum layer of the outer container helps to retain heat.

..... [1]

(b) The inner pot is made up of aluminium and stainless steel.

- (i)** State one method of heat transfer that causes the inner pot to gain heat quickly.

..... [1]

- (ii)** Explain how the material of the inner pot helps to retain heat by the method of heat transfer given in **(b)(i)**.

.....

.....

..... [2]

(c) The inner pot cover is made up of tempered glass.

- (i)** How does tempered glass prevent heat loss?

..... [1]

- (ii)** Explain which method of heat transfer process was prevented by the pot cover.

.....

.....

..... [2]

(d) Suggest a material used for the internal surface of the outer container to reduce heat loss.

..... [1]

[total: 10]

6. Fig. 6.1 shows the changes to the uterine lining during an average 28-day menstrual cycle and the hormones influencing the cycle of events.

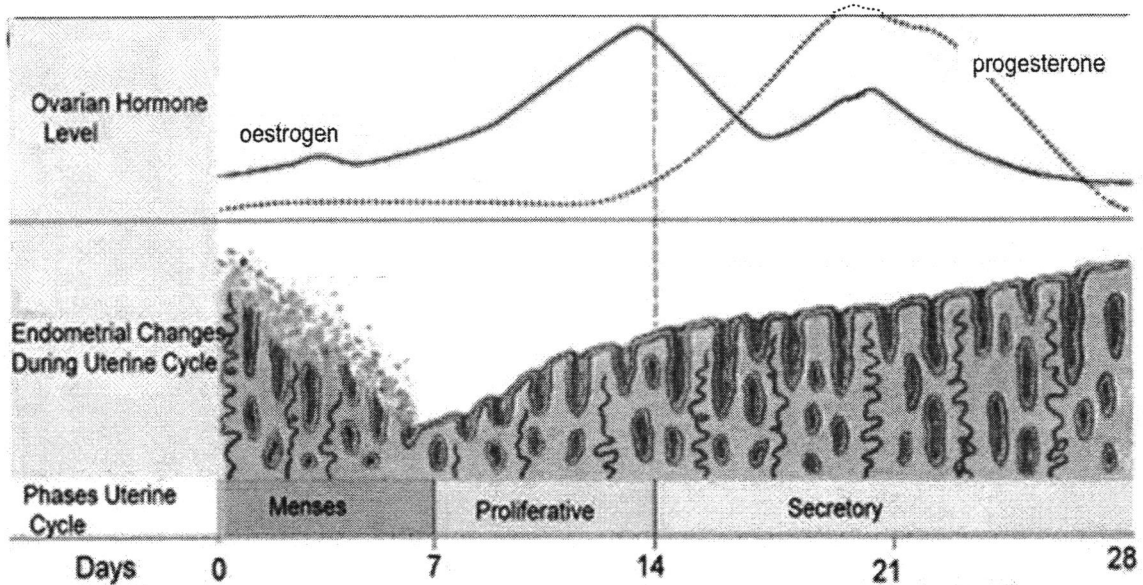


Fig. 6.1.

- (a) Describe the changes to the uterine lining with reference to Fig 6.1.

Days 1-6:

Days 7-11:

Days 12-28:

[3]

- (b) State the process that causes the change to the uterine lining from Days 1-6.

..... [1]

- (c) Ovulation occurs during Day 14. What is ovulation?

.....

..... [1]

- (d) With reference to Fig. 6.1, which sex hormone is responsible for ovulation?

..... [1]

- (e) Explain why there is a need for the change in uterine lining from Days 12 to 28.

.....
.....
..... [2]

- (f) With reference to Fig. 6.1, deduce what causes the change to the uterine lining after Day 28.

..... [1]

- (g) Suggest how the uterine lining maintain its thickness after Day 28, once there is an embryo implanted in the uterine lining.

.....
..... [1]

[total: 10]

END OF PAPER

Marking Scheme – 2E SA1 MYE 2019

Section A:

Qns	Ans	Qns	Ans	Qns	Ans
1	B	11	A	21	D
2	D	12	A	22	B
3	A	13	B	23	B
4	C	14	D	24	D
5	A	15	D	25	C
6	D	16	C	26	C
7	A	17	C	27	C
8	C	18	B	28	D
9	D	19	B	29	D
10	C	20	D	30	C

Section B:

Question		Answer	Marks	Comments
1	a	Allow some substances to pass through	1	Many students stated that only small substances can pass through.
	b	Level M: increase Level N: decrease	1	
	c	C: higher water concentration in the beaker than in the visking tubing; M: <u>water molecules moves into the visking tubing from the beaker through the partially permeable membrane <u>by osmosis</u>.</u>	1 1	Some did follow the CMR method, however many missed out on the water concentration comparison.
	di	There is <u>no</u> starch molecules present in the beaker.	1	
	dii	C: higher iodine concentration in the beaker than in the visking tubing; M: iodine molecules will move through the visking tubing by diffusion.	1 1	Common misconception made by students: mentioned osmosis instead of diffusion
	e	Only iodine and water is able to pass through the visking tubing/small enough to pass through the Visking tubing.	1	
2	a	no	1	
	b	Carbohydrates, fats and proteins (reject: all nutrients) (accept: maltose, fats, polypeptides/peptides)	2 (complete); 1 (1/3 or 2/3 mentioned)	Common mistake: only mentioned fats and/or proteins
	ci	There is <u>no chemical digestion of food in the mouth and in stomach</u> ; Fats will be <u>digested in the small intestine</u> ; <u>by lipase</u> to form glycerol and fatty acids;	1, 1, 1 (total = 3)	
	cii	Glycerol and fatty acids are small and soluble or presence of lipase from pancreas is able to digest the fats; These end-products will be absorbed in the small intestine before entering the large intestines	1 1	Most students missed out absorption in the small intestine or stated that absorption

							of fats happened in the large intestine.
3			natural, temporary methods	artificial, temporary methods*	permanent methods	6 *Choose two correct methods only.	Common mistake: Pulling out/or no ejaculation inside [feedback: is not a natural temporary method = there is still entry of sperms during pre-ejaculation.]
		1.	Abstinence	Diaphragm/ birth control pills/ condom/ spermicide/ intra-uterine devices	Male sterilisation		
		2.	Rhythm method		Female sterilisation		
	bi	Rhythm method (accept: any temporary methods except abstinence)				1	
	bii	The couple can chart the wife's menstrual cycle and to know when there will be high probability of conception. (accept: relevant explanation OWETTE, based on the method)				1	
4	ai	His mass will be the same/ 78kg				1	Common answer: 13kg
	aii	Weight on Earth: $78 \times 10 = 780 \text{ N}$ Weight on Moon: $780 / 6 = 130 \text{ N}$				1 (working) 1 (ans + unit)	Incomplete (missing one step)
	bi	Sharp ends				1	
	bii	Sharp end has smaller surface area; When exerting the same force, smaller area will exert a larger pressure.				1 1	Most used the scientific keywords of surface area and pressure correctly.

Section C:

Question	Answer	Marks	Comments
5	ai	By <u>conduction</u> ; the <u>presence of air</u> in between the pots act as an insulator to prevent heat transfer.	1 1 Most students didn't see the presence of air and used vacuum instead. Poorly done.
	aii	Vacuum is the perfect insulator; (accept insulator/poor conductor)	1
	bi	Conduction (accept: radiation)	1
	bii	Stainless steel/aluminium are good conductor of heat; Allows the container to gain heat quickly during cooking. (accept: shiny/smooth surfaces are poor absorbers/radiators; to ensure the heat is retain in the pot)	1 1
	ci	Tempered glass is poor conductor of heat/insulator;	1
	cii	Pot cover prevents the formation of convection current with the colder atmosphere/air; Allows the inner pot to retain the heat for longer periods of time	1 1 Most didn't understand the question and answered in response to glass being a poor conductor.
	d	Metal with Silvered walls/shiny surfaces	1
6	a	Day 1-6: <u>shedding</u> of uterine lining (accept: break down); Day 7-11: <u>repair and growth</u> of uterine lining;	1 1 1 Generally done ok (need to emphasise the keywords in the gradual

		Day 12-28: <u>thickening</u> of the uterine lining with more blood capillaries		change in the three stages.
	b	menstruation	1	
	c	<u>Release of one mature egg/ovum</u> from ovary	1	Common mistake: Ova is produced (feedback: produced before birth)
	d	oestrogen	1	
	e	To prepare for the implantation of an embryo; To help supply nutrients and oxygen from the blood capillaries	1 1	Poorly done.
	f	The fall of progesterone (hormone)	1	Poorly done. Most students did not refer to the figure to use the data.
	g	Other hormones/ chemicals secreted by the embryo	1	Poorly done. Most students mentioned about menstruation stopped.