



GRADE 11 EXEMPLAR PAPERS

**LIFE SCIENCES: PAPER I**  
**MARKING GUIDELINES**

Time: 2½ hours

150 marks

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**SECTION A****QUESTION 1**

1.1

- 1.1.1 antibiotic (1)
- 1.1.2 bronchitis, syphilis, TB, etc. (2)
- 1.1.3 Bacteria are no longer killed by the antibiotics / can survive in the presence of antibiotics. They have changed/mutated. (2)
- 1.1.4 (a) The patient feels better and stops taking the tablets. The bacteria population has not been completely killed off, some bacteria survive. When the antibiotic decreases the bacteria can reproduce once again and the size of the population increases. (2)
- (b) The course of tablets must be completed even if the patient is feeling better. This ensures that the bacteria are all killed. Live a lifestyle that is going to assist the patient and boost their immune system (diet). (3)
- 1.1.5 The lymphocytes can engulf the bacteria by means of pseudopodia. Antibodies are manufactured and these kill the bacteria (antigen). The code for the particular antigen is "stored" for future use if required. (5)
- [16]**

1.2

- 1.2.1 top label = sporangiophore/erect hypha  
bottom label = sporangium (2)
- 1.2.2 This fungus is a parasite because it is living off the potato plant/leaf  
It is harming the host (potato)  
as it is obtaining its food and water from it. (2)
- 1.2.3 (a) phloem (1)
- (b) The phloem is the tissue that transports dissolved nutrients and this is what the fungus requires to live. (2)
- 1.2.4 damp from the rain  
warmth (2)
- [9]**

- 1.3
- 1.3.1 B (2)
  - 1.3.2 The amount of blood pumped out of the heart in cm<sup>2</sup> per minute. (2)
  - 1.3.3 The heart rate (beats per minute) (1)
  - 1.3.4 type of exercise  
the same male (2)
  - 1.3.5 pulse rate (1)
  - 1.3.5 By placing the fingers/an electronic device on the pulse on the  
underside of a wrist/on the side of the neck.  
The number of beats is counted in a minute. (4)
- [12]**

- 1.4
- 1.4.1 1 suspensory ligament  
2 lens  
3. cornea/conjunctiva  
5. iris  
6. retina (5)
  - 1.4.2 5 and 7 (2)
  - 1.4.3 No tension could be exerted on the suspensory ligaments.  
The lens therefore would not be able to change its shape.  
Eyesight would be blurred/Focussing power would be altered (3)
  - 1.4.4 (a) D (1)  
(b) C (1)  
(c) A (1)
- [12]**

**Total for Section A: 50 marks**

**SECTION B**

2.1 pancreas (1)

2.2 insulin and glucagon (2)

2.3

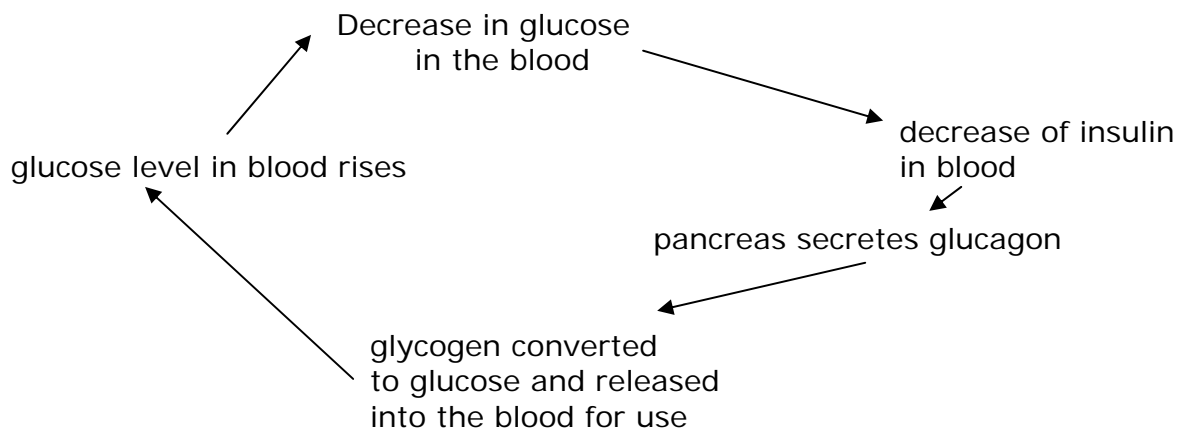
2.3.1 Secretion is the release of a useful substance from a cell or organ. (1)

2.3.2 Excretion is the release of an unwanted/waste product from a cell or organ. (1)

2.4

2.4.1 A "message" that is relayed to the relevant organ to bring about the opposite effect to that which is in action at that time. This is to maintain equilibrium. (4)

2.4.2



(5)

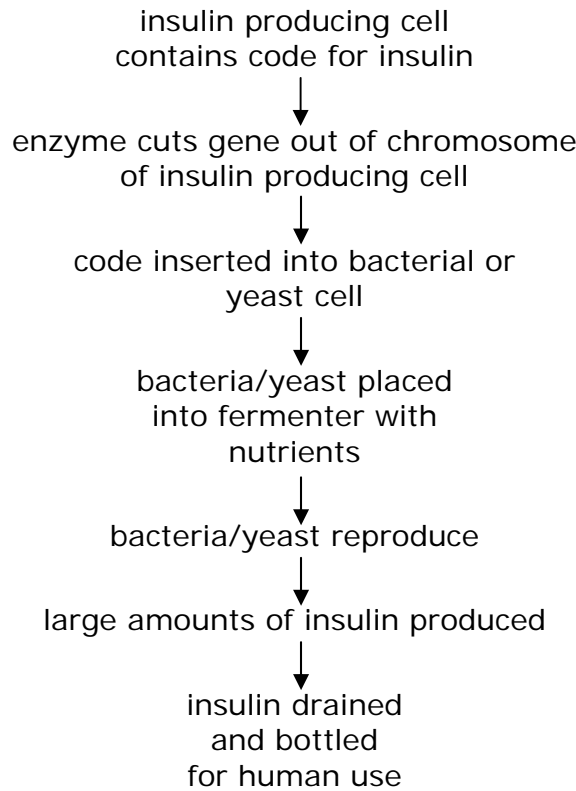
2.5 Diabetes is the lack of insulin. Glucose cannot be absorbed by cells for energy release/to be converted into glycogen for storage. There is too much free glucose in the blood and this can lead to the dehydration of cells, especially brain cells causing a person to fall into a coma. (3)

2.6

2.6.1 These organisms reproduce rapidly by mitosis (binary fission). In this way a lot of insulin can be produced quickly. (2)

2.6

2.6.2



Checklist:

arrows present - yes or no	1/0
a progression is shown (linear/cycle)	1/0
4 or more steps	2/1/0
neat and easy to follow (not crowded)	1/0

(5 of 7)

2.6.3 convincing argument (for or against)	3/2/1/0
biological facts to support argument	3/2/1/0

(6)

3.1 To survive  
it needs to enter a living cell to reproduce.

(2)

3.2 The polio drops will contain some polio virus (antigen).  
These enter the blood system. The immune system will be triggered into action.  
Lymphocytes will make antibodies that kill the polio virus (antigen).  
The antibodies will prevent the person from contracting polio because as soon as the polio virus enters the blood system again the necessary antibodies will be made immediately to kill the antigens.

(6)

**[8]**

- 4.1 Adrenalin stimulates heart function (1)
- 4.2 Blood must keep flowing to cells to deliver oxygen for respiration  
OR  
Blood must keep flowing away from cells to remove wastes to prevent poisoning of cells (2)
- 4.3  $60 \rightarrow 96$   
= 36  
beats per minute
- 4.4 The adrenalin from the injection would have stimulated the heart rate to increase initially and once the adrenalin was metabolised the amount decreased and therefore the heart rate would decrease. (4)
- 4.5 Veins take blood straight to the heart.  
In muscles it would have to be absorbed into capillaries and only then go to heart. (3)
- 4.6 Muscles relax  
all vessels dilate  
blood floods into capillaries. (3)
- 4.7 Pupils dilate  
increase in breathing rate  
increase in muscle strength, etc. Any 2 (2)
- 5.1 W = chordae tendonae/heart tendons/tendonous chords  
X = semi lunar valve (cusp)  
Z = bicuspid valve (cusp) [18] (3)
- 5.2 Ventricle volume  
has decreased;  
Semilunar valve  
is open;  
Bicuspid valve  
is closed. ANY 2 (4)
- 6.1 Transmit electrical impulse  
across synapse [7] (2)
- 6.2 Higher doses are lethal / toxic;  
receptors are harmed;  
more receptors are needed to trigger the same response. ANY 2 (2)
- 6.3 Tolerance develops – need consistently more to produce the same effect (1)
- 6.4 Receptors needed to produce a response are damaged (1)
- 6.5 Curing diseases;  
relieving headaches;  
anaesthetics. ANY 2 (2)

- 6.6 Increased crime;  
increased poverty;  
reduction in productivity, etc. ANY 2 reasonable (2)
- 6.7 Use drugs to relieve feelings of depression or anxiety – aren't prepared to try to find solutions to problems.  
Explanation shows understanding and is well expressed (4-5)  
Explanation shows some understanding but expression is not good (2-3)  
Explanation shows little understanding (1-2) (5)

**Total Section B: 80 marks**

**SECTION C**

CRITERIA	LEVELS OF PERFORMANCE			
	4	3	2	1
<b>Information</b>	Response is concise and logical, flows well with little repetition. Shows insight and a clear understanding of all the information contained in the brief. No paraphrasing. The details are sufficient and accurate. <b>(8 marks)</b>	Response is logical. It shows a general but not detailed insight and understanding of the information contained in the brief. Little paraphrasing. Some details are lacking and/or display some inaccuracies. <b>(6 marks)</b>	Attempt at a response but loss of focus at times/longwinded/ Repetitive. It shows a limited understanding of the information contained in the brief and/or too much paraphrasing. Important details are lacking and/or inaccurate. <b>(4 marks)</b>	Response is muddled and/or longwinded and/or repetitive. Shows a poor understanding of the information contained in the brief and/or too much paraphrasing. The details are generally inaccurate. <b>(2 marks)</b>
<b>Structure and Language</b>	Well structured argument. Correct scientific language used. Correct spelling of scientific terminology. <b>(4 marks)</b>	Flawed in one aspect. <b>(3 marks)</b>	Flawed in two aspects. <b>(2 marks)</b>	Flawed in all aspects. <b>(1 mark)</b>
<b>Advice</b>	Choice made presented clearly with reasons so that advice is sensible and based on sound logic using the information and data. Correct tone is used, not patronising or condemnatory. <b>(8 marks)</b>	Choice of treatment is clear but not well justified OR Advice not based on information and data OR Incorrect tone is used <b>(6 marks)</b>	Choice of treatment is clear but not well justified and advice not based on information and data and/or incorrect tone is used. <b>(4 marks)</b>	Not clear which treatment is being advised hence attempt at justification is unfocused and tone inappropriate. <b>(2 marks)</b>

**[20]**

**Total for Section C: 20 marks**