GRADE 11 EXAMINATION
NOVEMBER 2007

LIFE SCIENCES: PAPER I
SECTION A

MARKING GUIDELINES

Time: 2½ hours Total marks: Section A = 50, Section B & C = 100

The marking guide is a working document prepared for use by teachers as they assess the Grade 11 externally set examinations.

There may be different interpretations of the marking guidelines but the teacher should keep as closely as possible to the suggested way of assessing. When in doubt, a teacher should check with another member of the cluster or with the relevant Assessment Specialist.

SECTION A

Answer the questions from this section in this booklet. Place this booklet inside the Answer Book in which you answer Section B and C.

QUESTION 1

1.1 Select the **term** in the right column which best matches the **description** in the left column. Write the letter of the term in the corresponding space provided between the brackets. Use each letter only once.

	DESCRIPTION		**TERM**
[**J**]	A description of a hormone.	A	Endocrine gland
[**H**]	This condition is caused by an oversecretion of growth hormone.	B	Oestrogen
[**F**]	This gland is situated beneath the brain.	C	Testosterone
[**E**]	This hormone is associated with the 'fight or flight' response.	D	Exocrine gland
[**B**]	This hormone is produced by the ovary.	E	Adrenalin
[**C**]	This hormone controls the production of sperm.	F	Pituitary
[**I**]	A swelling caused by an over or under secretion of the thyroid gland.	G	Pancreas
[**G**]	This organ contains exocrine and endocrine parts.	H	Giantism
[**A**]	This type of gland secretes hormones into the blood stream.	I	Goitre
[**D**]	This type of gland secretes into a duct.	J	Chemical messenger

[10]

1.2 Five multiple choice questions about transport in plants are given below. Choose the most correct alternative in each question and write its letter in the space provided in the table.

Question	1.2.1	1.2.2	1.2.3	1.2.4	1.2.5
Answer	**C**	**A**	**A**	**C**	**B**

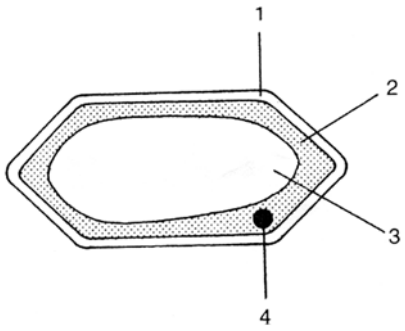
1.2.1 Water and dissolved substances from the soil, and the solution of nutrients produced by leaves, are carried in ...

A the same cells.
B the same direction.
C different cells.
D leaf cells only.

1.2.2 Phloem tissue is ...

A found in vascular bundles.
B made up entirely of non-living cells.
C a tissue which only conducts nutrients by diffusion.
D found in leaves only.

1.2.3 Refer to the digram below in order to answer this question.



[Adapted from *New Higher Biology; Multiple Choice and Matching*; J Torrance]

The diagram above shows a type of plant cell. Compared with this cell, a mature xylem vessel would possess ...

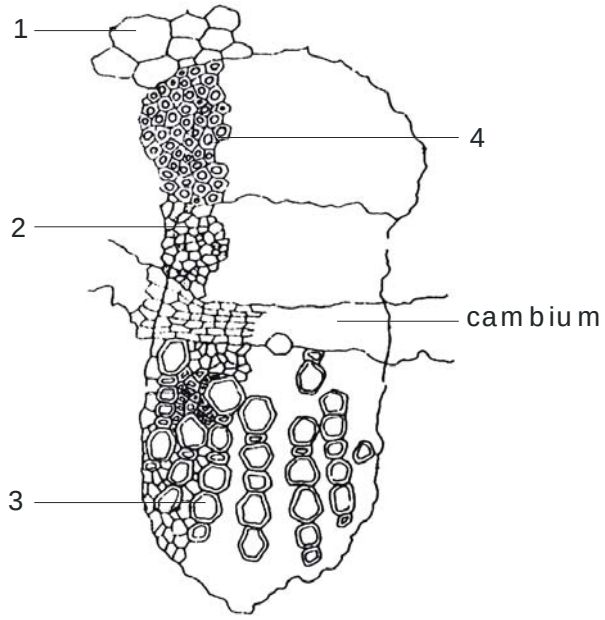
A 1 only.
B 1 and 2 only.
C 1, 2 and 3 only.
D 1, 2, 3 and 4.

1.2.4 Which of the following are **both** structurally suited to perform the functions of water transport and support in a plant?

A sieve tube and companion cell
B xylem vessel and companion cell
C tracheid and xylem vessel
D sieve tube and tracheid

1.2.5 Refer to the following diagram to answer the following question.

Diagram below shows a vascular bundle from the stem of a Sunflower plant

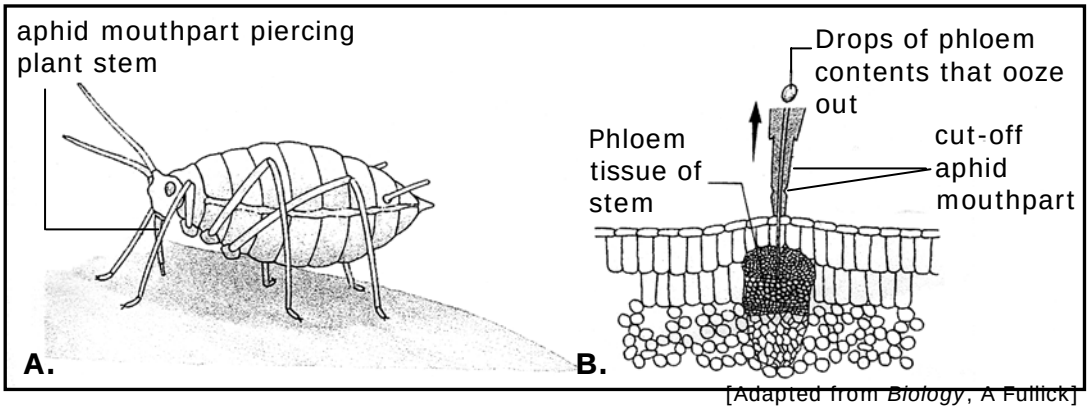


Which combination indicates the correct conducting tissues found in this vascular bundle?

A 1 is xylem and 3 is phloem
B 2 is phloem and 3 is xylem
C 4 is xylem and 3 is phloem
D 2 is xylem and 3 is phloem

[10]

1.3 The diagrams below illustrate aspects of transport in plants and insects. The insect shown at A is an aphid. It pierces the plant stem and sucks out fluid. The diagram at B shows the cut–off mouthparts of this insect with drops of fluid oozing from it.



[Adapted from *Biology*, A Fullick]

1.3.1 Name the part of a plant where the 'phloem contents' fluid is made.

leaves (1)

1.3.2 A peach farmer wants to carry out an experiment using aphids to help him sample the contents of the phloem in his peach trees. This may help him to grow peaches that are very sweet.
This investigation can be written up by using the scientific method. The hypothesis is given to you. Provide a suitable aim and possible method for this investigation.

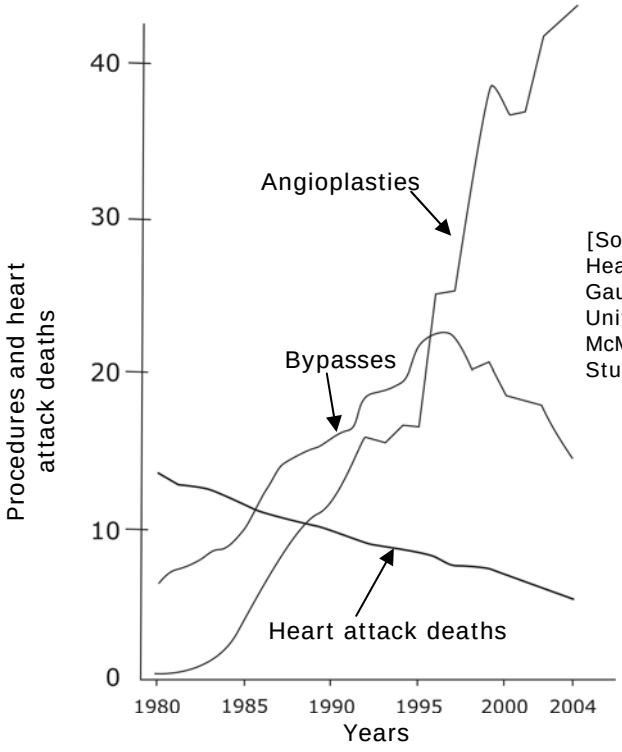
Hypothesis: The more sugar in the phloem, the sweeter are the peaches.

Aim: **To investigate the relationship between sugar in the phloem and sweetness in peaches ✓**

Method:

1. **Place many aphids onto a peach tree and after they have attached remove the animals and cut off the mouthparts ✓**
2. **When fluid starts to be released from the mouthparts, collect ✓ this and analyse it for sugar content ✓**
3. **Collect the peaches and compare the sugar content of the peaches and the content of the fluid collected from the stem ✓** (5)

1.3.3 The following graph illustrates the relationship between two types of medical procedures and heart attack deaths from an article in *The National Geographic*, February 2007. Use this to answer the questions which follow.



[Source: Thomas Thom, National Heart, Lung, and Blood institude: Gautam Gowrisankaran, Washington University in St. Louis, Salim Yusuf, McMaster University, The Interheart Study]

- Angioplasties are medical procedures which do not involve complicated surgery and which increase blood flow through blocked blood vessels.
- By-passes are complicated surgical procedures which are used for the same purpose.

(a) Which of these two procedures has become more common in recent years?

Angioplasties ✓ (1)

(b) Describe the relationship between Angioplasties and By-passes since 1996.

As the angioplasties have increased ✓ so bypasses have decreased ✓ (2)

(c) In which year did Angioplasties start to be performed?

1980 (1)

(d) Both these procedures are expensive. Do you think the money spent on these modern procedures is justified? Give a reason for your answer.

Yes, heart attack deaths have decreased and this saving of lives must be worth the money spent. (2)

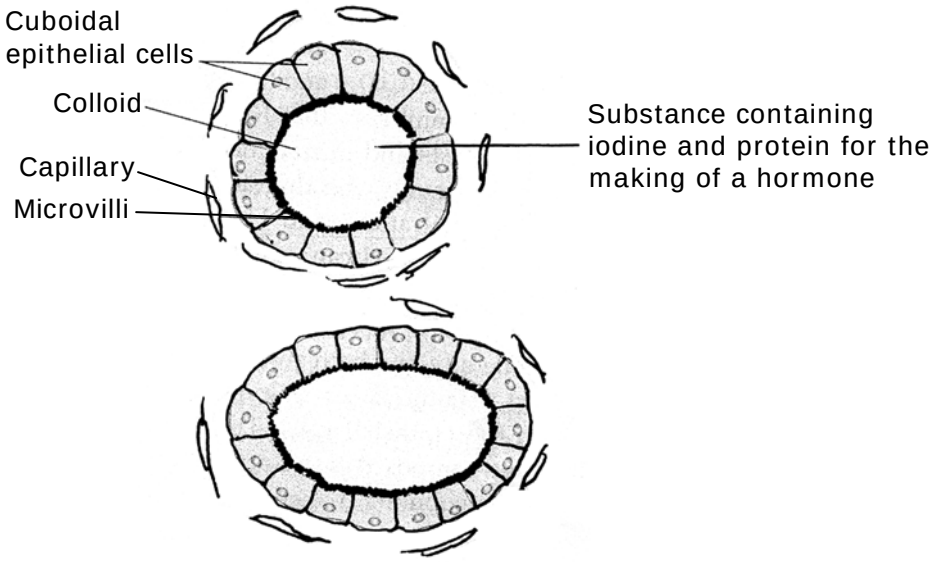
[12]

1.4 Complete the following table to compare the nervous and endocrine systems. Put a **tick** in each correct box for the features shown.

Feature	Nervous system	Endocrine system
Usually have longer lasting effects		✓
The faster coordination system	✓	
Charged particles, e.g. potassium and sodium, involved in the transmission of impulses	✓	
Cells communicate by substances in the blood plasma		✓
Contains the autonomic system	✓	

[5]

1.5 Observe these diagrams of a section through the thyroid gland.



Using the information given above and your own knowledge complete the following flow diagram.

The iodine and the protein are

↓

absorbed by the epithelial cells. **cuboidal**

↓

The absorption is increased by **microvilli** which increase the surface area.

↓

These substances are converted into **thyroxine** which is a hormone.

↓

This hormone controls the **metabolic/chemical/reaction** rate in the body.

↓

This hormone moves into the **blood** which distributes it to the whole body.

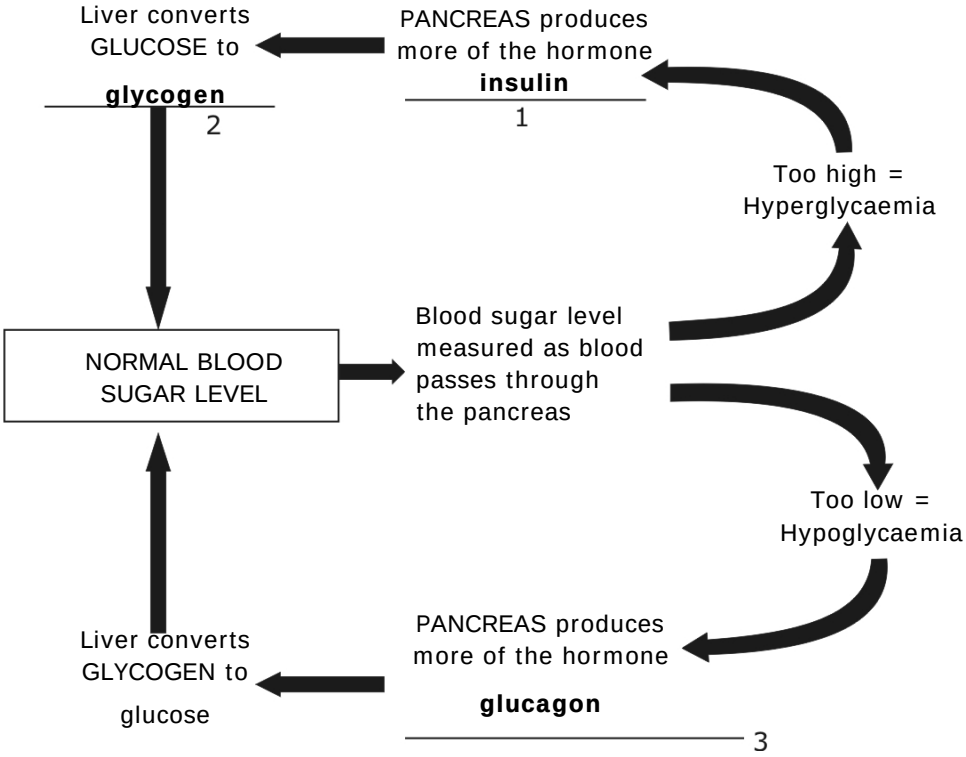
↓

The levels of this hormone are monitored by **pituitary**, the master gland, found below the brain.

[6]

1.6 Study this flow diagram representing hormonal interactions that control the levels of glucose in the body. Answer the questions which follow. (3)

1.6.1 Fill in the **words missing** from this flow diagram.



[Adapted from *AS and A level Human Biology through diagrams*; W R Pickering]

Name another hormone that also stimulates the conversion indicated at 4 on the diagram ;

1.6.2 in order to provide the body with more energy for an 'emergency'.

Adrenalin (1)

1.6.3 If the processes shown in the flow diagram are not functioning correctly a change in the composition of urine is detected. What would this change be?

Glucose detected (1)

1.6.4 Which organ, shown in this diagram, can be termed the sensor for the sugar levels?

Pancreas (1)

1.6.5 Which organ, shown in this diagram, can be termed the regulator to control the blood sugar levels?

Liver (1)

[7]

50 marks

Total for Section A: 50 marks