Name of Candidate: _____ ID No.: _____

Department of Psychology

Biology Test for Mature Students

September 2011

Examination duration: 1 hour

Answer ALL questions in this paper in the spaces provided. You are not allowed to continue your answers on any sheets other than those provided in this booklet. The mark allocation is indicated at the end of each question.

1. Briefly explain the homeostatic function of the following:

(a) skin thermoreceptors: _____

_____

(*2 marks*)

(b) thermoreceptors of the hypothalamus: _____

_____

(*2 marks*)

(c) chemoreceptors in the pancreas: _____

_____

(*2 marks*)
(Total: 6 marks)

2. (a) Complete the following table about blood sugar level control:

Hormone	**Stimulus**	**Result**	**Mechanism used**
Insulin		Glucose is stored	i. increasing the rate at which glucose is stored into glycogen in the liver and muscles
			ii.
			iii.
	Decrease in glucose level in the blood		i.

(*6 marks*)

(b) (i) Name of the organ responsible for the control blood glucose concentration.

_____

(ii) Name of the groups of specialised cells responsible for the production of hormones that control blood glucose levels

_____

(*2 marks*)

(c) Briefly describe what is meant by the term *negative feedback.*

_____

_____

_____

(*3 marks*)
(Total: 11 marks)

3. (a) Briefly explain why after heavy exercise a person (i) feels hot, (ii) appears red in the face and (iii) sweats profusely.

_____

_____

_____

_____

(*3 marks*)

(b) Briefly explain why in cold weather we (i) shiver, (ii) appear pale in the face and (iii) get goose pimples (i.e. our body hair stands on end).

_____

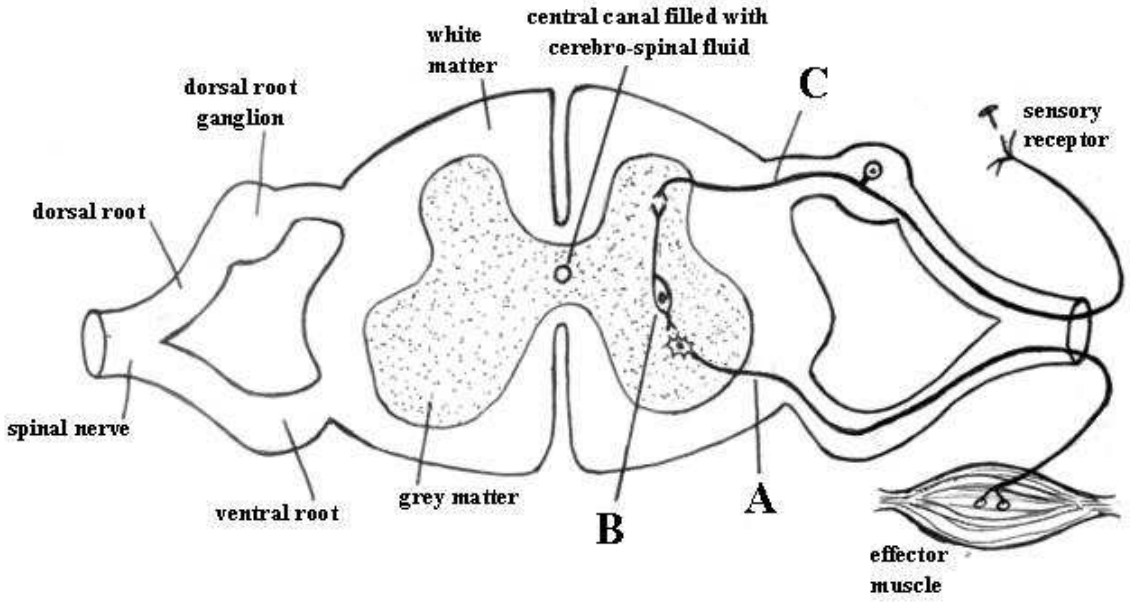
_____

_____

_____

(*3 marks*)
(Total: 6 marks)

4. The diagram below shows a transverse section through the spinal cord showing a reflex arc.



(a) Name the structures labelled A, B and C:

A: _____ **B:** _____ **C:** _____

(*3 marks*)

(b) What gives the **white matter** its white appearance?

_____

(*1 mark*)

(c) What is the **grey matter** composed of?

_____

(*1 mark*)

(d) Draw arrows **on the diagram** to show how a nerve impulse travels along the reflex arc.

(*1 mark*)

(e) What is a reflex action and why is it important?

_____

_____

_____

(*2 marks*)

(f) Briefly outline the function of the **cerebro-spinal fluid**.

_____

_____

(*2 marks*)
(Total: 10 marks)

5. Fill in the following table with the most appropriate term from the list below. (*Each term can be used once, more than once or none at all*).

synapse	**medulla oblongata**	**motor area**	**ganglion**
cerebellum	**hypothalamus**	**sensory area**	**dendrite**
cerebrum	**association areas**	**myelin sheath**	**cell body**

	acts as an insulating layer around axons and increases the speed at which nerve impulses travel.
	main control center for the autonomic nervous system.
	the branching process of a neurone that conducts impulses toward the cell.
	a junction that allows a nerve impulse to travel from one neurone to another.
	connects the spinal cord with the rest of the brain. It is the automatic control centre for heartbeat, breathing, swallowing, coughing and sneezing.
	a mass of neurone cell bodies.
	controls balance, co-ordination of movements and timing.
	largest part of the brain, consisting of two hemispheres and serving to control voluntary movements and coordinate mental actions.
	function to produce a meaningful perceptual experience of the stimuli received.
	produces hormones that control the hormonal secretions of the pituitary gland.

(Total: 10 marks)

6. (a) Briefly distinguish between the sympathetic nervous system (SNS) and parasympathetic nervous system (PSNS).

_____

_____

_____

_____

(*4 marks*)

(b) From the following list of body functions underline the functions that are controlled by the parasympathetic nervous system (PSNS).

- **increase heart beat rate**
- **saliva production for digestion**
- **tear production**
- **urination**
- **dilation of pupil**
- **dilation of bronchioles**
- **movement of faeces along intestines**

(*4 marks*)
(Total: 8 marks)

7. (a) Complete the following table by giving the function of each structure listed.

Eye lashes	
Choroid	
Sclerotic	
Iris	
Retina	
Ciliary body	
Conjunctiva	

(*7 marks*)

(b) Briefly explain the changes that occur in the eye in **bright** light.

_____

_____

(*2 marks*)

(c) Highlight the changes that occur in the eye when looking at a **distant** object.

_____

_____

_____

_____

(*4 marks*)
(Total: 13 marks)

8. (a) Complete the following table by giving the function of each structure listed.

Pinna	
Auditory ossicles	
Cochlea	
Semicircular canals	
Eardrum	
Eustachian Tube	

(*6 marks*)

(b) What is the function of the *ear wax*?

_____

_____

(*2 marks*)

(c) Briefly outline how hearing occurs.

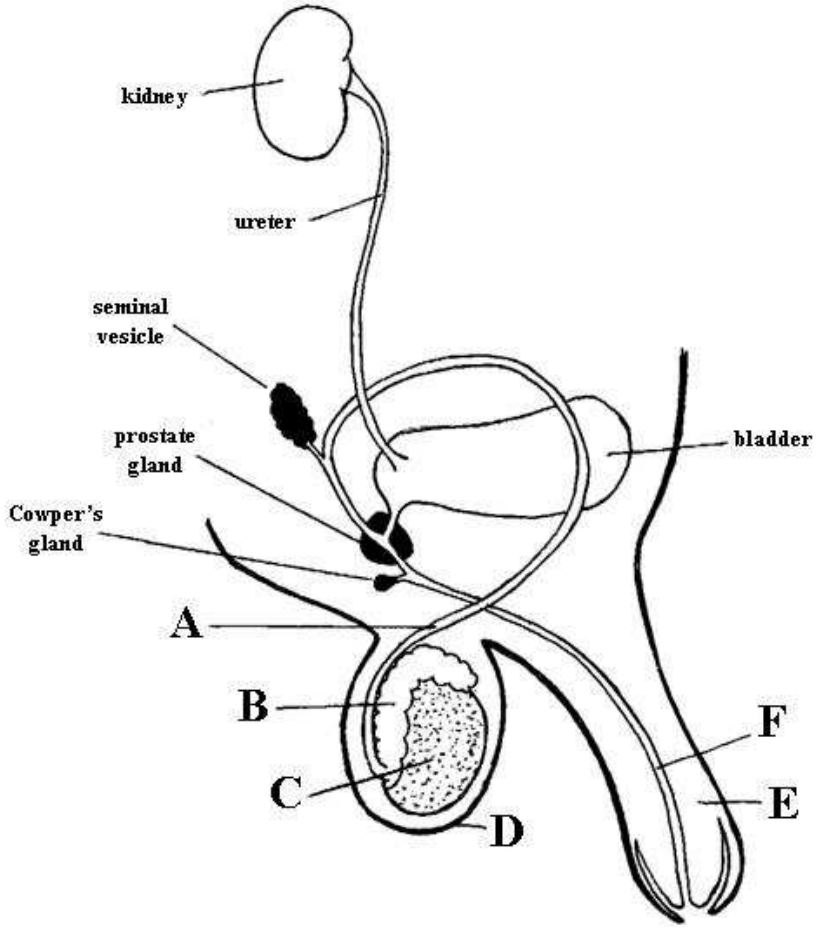
_____

_____

_____

(*3 marks*)
(Total: 11 marks)

9. The diagram below shows the structure of the male reproductive organ.



(a) Name and state the function of the structures marked with the following letters:

A: _____ : _____

_____

B: _____ : _____

_____

C: _____ : _____

_____

D: _____ : _____

_____

E: _____ : _____

_____

(*10 marks*)

(b) Briefly outline the collective function of the Cowper's gland, prostate gland and the seminal vesicle.

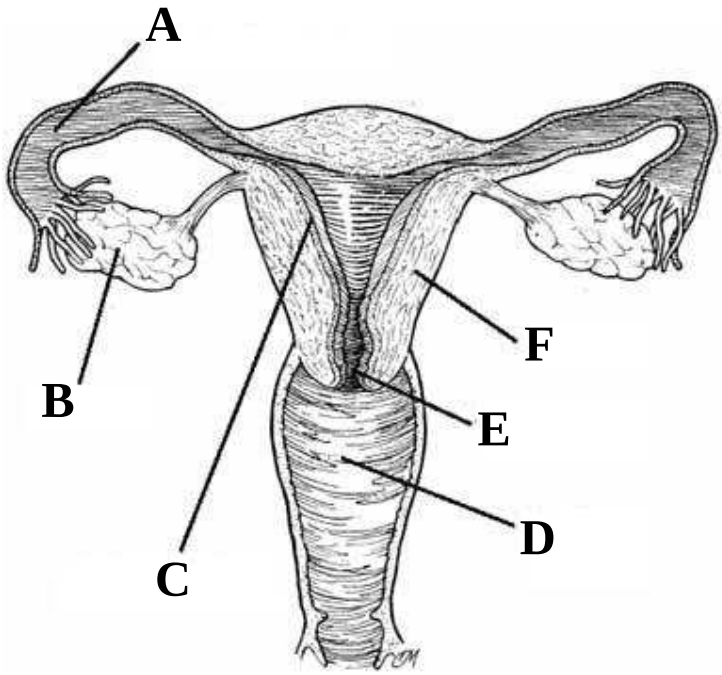
_____

_____

_____

(*2 marks*)
(Total: 12 marks)

10. The diagram below shows the structure of the female reproductive organ.



(a) Name and state the function of the structures marked with the following letters:

A: _____ : _____

_____

B: _____ : _____

_____

C: _____ : _____

_____

D: _____ : _____

_____

E: _____ : _____

_____

(*10 marks*)

(b) On the diagram provided:

(i) Put an **X** to mark the site where **fertilization** occurs.

(ii) Put a **Y** to mark the site where **FSH** (Follicle Stimulating Hormone) acts.

(iii) Put a **Z** to mark the site that secretes **progesterone**.

(*3 marks*)
(Total: 13 marks)