Rewarding Learning

Centre Number

71	

Candidate Number

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2013

Health and Social Care

Assessment Unit AS 14

assessing

Unit 14: Understanding Human Physiology

[A3H81]

A3H81

TUESDAY 21 MAY, MORNING

TIME

2 hours.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all four** questions.

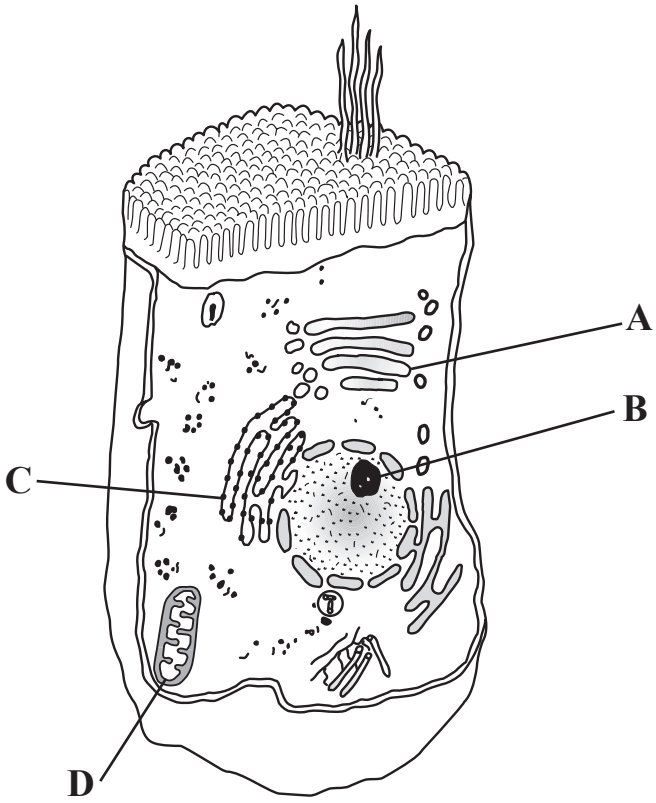
INFORMATION FOR CANDIDATES

The total mark for this paper is 100.
Quality of written communication will be assessed in questions **1(c)(iii)**, **2(c)** and **4(d)(iii)**.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

For Examiner's use only	
Question Number	**Marks**
1	
2	
3	
4	
Total Marks	

Examiner Only	
Marks	Remark

1 **(a)** The diagram below shows the structure of a human cell in the ileum.



The cell contains organelles labelled A, B, C and D. Write down the name and **one** function of A, B, C and D.

A Name: _____ [1]

Function: _____

_____ [1]

B Name: _____ [1]

Function: _____

_____ [1]

C Name: _____ [1]

Function: _____

_____ [1]

D Name: _____ [1]

Function: _____

_____ [1]

(b) The table below shows the components of the blood collected after centrifugation. Complete the table below to identify **one** function of each of the blood components shown.

Blood components	Function
	
	
	
	

Figure from: © ORG Biology, through Diagrams by W R Pickering (OUP, 1996), reproduced by permission of Oxford University Press

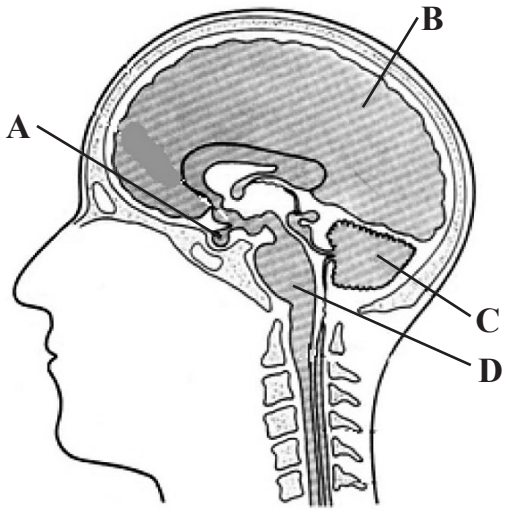
[4]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

(c) The diagram below shows part of the central nervous system.



(i) Name parts A, B, C and D.

A _____ [1]

B _____ [1]

C _____ [1]

D _____ [1]

(ii) Write down the two main physical causes of a stroke.

1. _____ [1]

2. _____ [1]

(iii) Analyse the role of the pituitary gland in the homeostatic control of water in the body.

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

[9]

Examiner Only	
Marks	Remark

2 **(a)** The diagram below shows a motor neurone attached to a muscle.

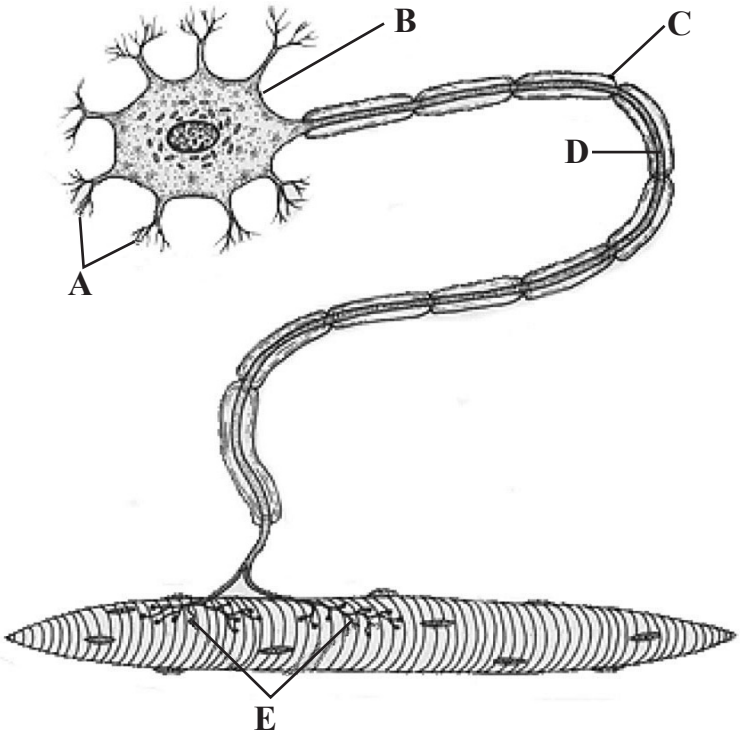


Figure from © Illustrated Biology by B S Beckett (OUP, 1978), reproduced by permission of Oxford University Press

(i) Identify parts A, B, C and D.

A _____ [1]

B _____ [1]

C _____ [1]

D _____ [1]

(ii) Write down the muscle type shown in the diagram.

_____ [1]

(iii) Part E shows the synapse between the nerve fibre and the muscle. Describe how messages travel from the nerve fibre to the muscle.

[6]

Examiner Only	
Marks	Remark

(b) The cell body of the motor neurone is found in the grey matter of the spinal cord, which is part of the Central Nervous System (CNS). Damage to the CNS can cause paraplegia or quadriplegia.

Write down what is meant by the terms paraplegia and quadriplegia.

Paraplegia

_____

_____ [1]

Quadriplegia

_____

_____ [1]

Examiner Only	
Marks	Remark

(c) Allison, aged 35 and single, is highly motivated and physically fit. She works as a motorbike courier for a large parcel delivery firm. Allison lives on her own in a third floor apartment in the city. Following a motorbike accident Allison is now paraplegic. Evaluate how this may affect Allison's lifestyle.

Examiner Only	
Marks	Remark

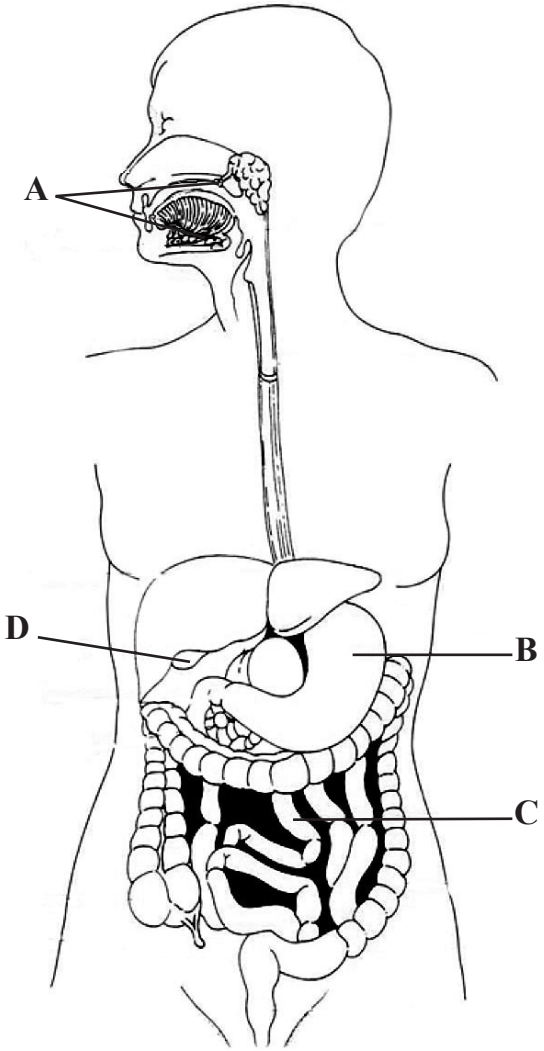
Examiner Only

Marks	Remark

[9]

Examiner Only	
Marks	Remark

3 **(a)** The diagram below shows some of the main parts of the digestive system.



© Biological Science 1 & 2, 3rd edition by D J Taylor, N P O Green & G W Stout, published by Cambridge University Press, 1997. ISBN 0521561787

(i) Explain why the stomach (**B**) is described as an organ.

_____

_____

_____

_____ [2]

(ii) Sally has recently begun to experience stomach pain after eating. Her GP suspects she may have a stomach ulcer. Describe how an ulcer develops in the stomach.

Examiner Only

Marks	Remark

_____

_____

_____

_____

_____

_____ [3]

(iii) Structure C is the part of the digestive system that allows food to be absorbed into the blood. Identify Structure C.

_____ [1]

Write down three ways this structure has adapted to allow maximum absorption of food into the blood.

Adaptation 1 _____

_____ [1]

Adaptation 2 _____

_____ [1]

Adaptation 3 _____

_____ [1]

(iv) Complete the table below to identify the enzymes, substrates and end products produced in parts A, B and C of the digestive system. Some of the table has been completed for you.

Part	Enzyme	Substrate	End Products
A	Carbohydrase		
B			Amino Acids
C		Lipids	

[6]

(v) Structure D is the gall bladder which stores bile. Identify the organ which produces bile.

_____ [1]

(vi) Write down two functions of bile.

1. _____ [1]

2. _____ [1]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

(b) (i) The sugars produced during digestion are taken via the blood to the liver for storage as glycogen. Complete the diagram by naming the two hormones which control the processes shown below.

Blood sugar levels high
body releases

Glucose (sugar) ⟶ ⟵ **Glycogen**

Blood sugar levels drop
body releases

[2]

(ii) Excess amino acids must be removed during a process called deamination. Write down the part of the body where deamination takes place.

_____ [1]

(iii) One of the products of deamination is urea. Describe how urea is removed from the body.

_____

_____

_____

_____

_____

_____ [3]

Examiner Only	
Marks	Remark

4 **(a)** Explain the term homeostasis.

_____

_____

_____

_____ [2]

(b) The diagram below shows part of the excretory system.

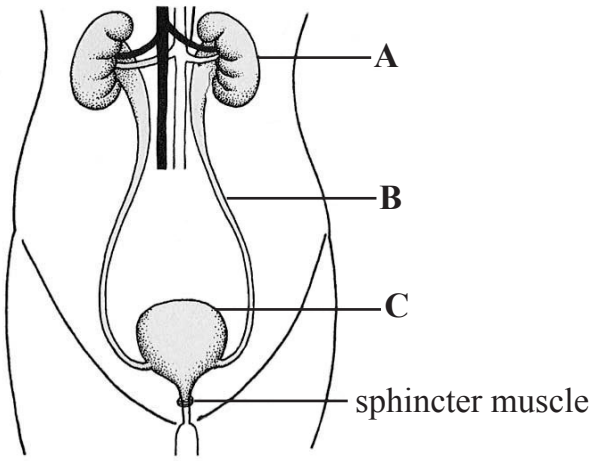


Figure from © Illustrated Biology by B S Beckett (OUP, 1978), reproduced by permission of Oxford University Press

(i) Write down the name and function of parts A, B and C.

A Name _____ [1]

Function _____

_____ [1]

B Name _____ [1]

Function _____

_____ [1]

C Name _____ [1]

Function _____

_____ [1]

(ii) Andy has urinary incontinence. Explain the cause of his condition.

Examiner Only
Marks | Remark

_____

_____

_____

_____ [2]

(c) The table below shows the percentage composition of blood plasma and urine for four substances.

Component	Blood Plasma %	Urine %
Water	90	90
Plasma Protein	8	0
Glucose	0.1	0
Urea	0.03	2

Use your knowledge of filtration in the kidney nephron to explain the following:

Absence of plasma proteins in the urine.

_____

_____ [2]

Absence of glucose in the urine.

_____

_____ [2]

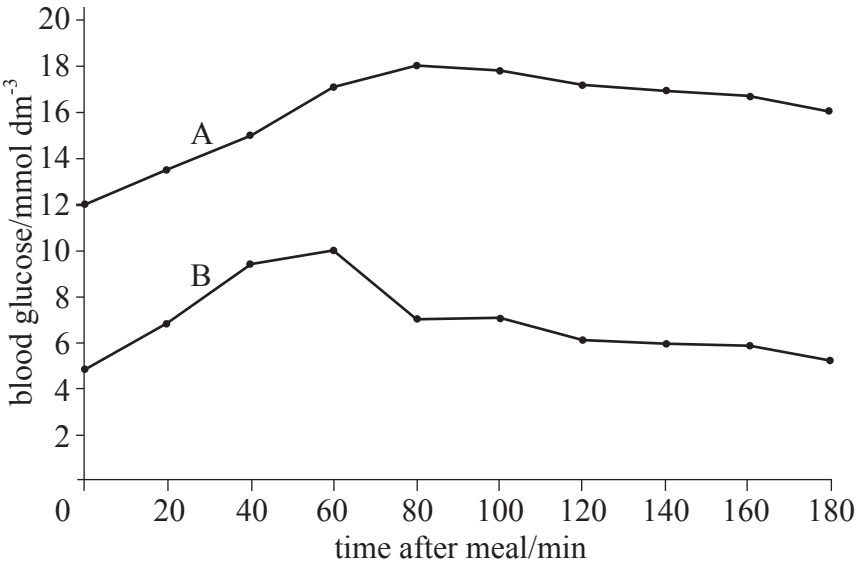
Higher concentration of urea in the urine than in the blood.

_____

_____ [2]

Examiner Only	
Marks	Remark

(d) The graph below shows the change in blood glucose levels of individuals A and B at hourly intervals after a meal.



(i) State the normal range for blood glucose levels in a healthy person.

_____ **to** _____ mmol dm^{-3} [1]

(ii) Which of the two lines represents the individual with diabetes?

_____ [1]

(iii) Analyse the information shown in the graph for individuals A and B.

_____

_____

_____

_____

_____

_____

_____

_____

_____

Examiner Only	
Marks	Remark

[9]