

**GENERAL CERTIFICATE OF SECONDARY EDUCATION
TWENTY FIRST CENTURY SCIENCE
ADDITIONAL APPLIED SCIENCE A**

A324/02

Life Care
(Higher Tier)

**Wednesday 21 January 2009
Afternoon**

Duration: 45 minutes

Candidates answer on the question paper
A calculator may be used for this paper

OCR Supplied Materials:
None

Other Materials Required:

- Pencil
- Ruler (cm/mm)



Candidate Forename		Candidate Surname	
--------------------	--	-------------------	--

Centre Number						Candidate Number				
---------------	--	--	--	--	--	------------------	--	--	--	--

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **36**.
- This document consists of **8** pages. Any blank pages are indicated.

FOR EXAMINER'S USE		
Qu.	Max.	Mark
1	10	
2	6	
3	9	
4	6	
5	5	
TOTAL	36	

Answer **all** the questions.

- 1 Kate is a hospital scientist.
She tests urine samples for chemicals which indicate specific medical conditions.

(a) Give **two** chemicals urine may be tested for and suggest what their presence indicates.

.....

.....

.....

..... [4]

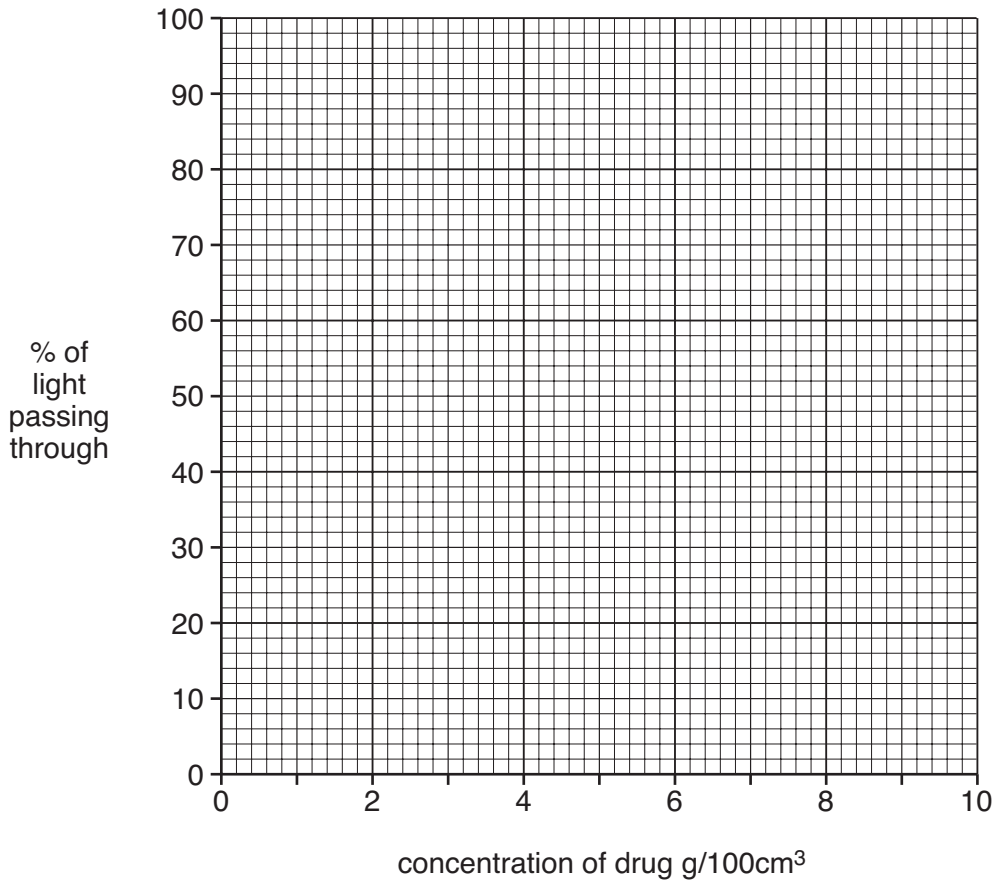
- (b) Kate receives a urine sample from an athlete suspected of taking a banned drug.
She needs to know how much of the drug is present in the urine sample.
First she makes a graph with known concentrations of the drug.
She uses a test which measures the amount of light passing through a liquid.
She dissolves different quantities of the drug and measures the amount of light passing through it.

These are her results.

concentration of drug (g/100 cm ³)	% of light passing through
0	100
1	85
2	70
4	40
8	15

(i) Plot Kate's results on the grid below.

Draw a smooth curve through the points.



[3]

(ii) Kate tests the unknown urine sample.
 In this sample 55% of the light passed through.
 Use the graph to find the concentration of the drug in this sample.

concentration = g/100cm³ [1]

(c) Kate also tests a number of other types of samples that are taken for analysis.
 List **four** samples other than urine, Kate might have to test.

1.
2.
3.
4.

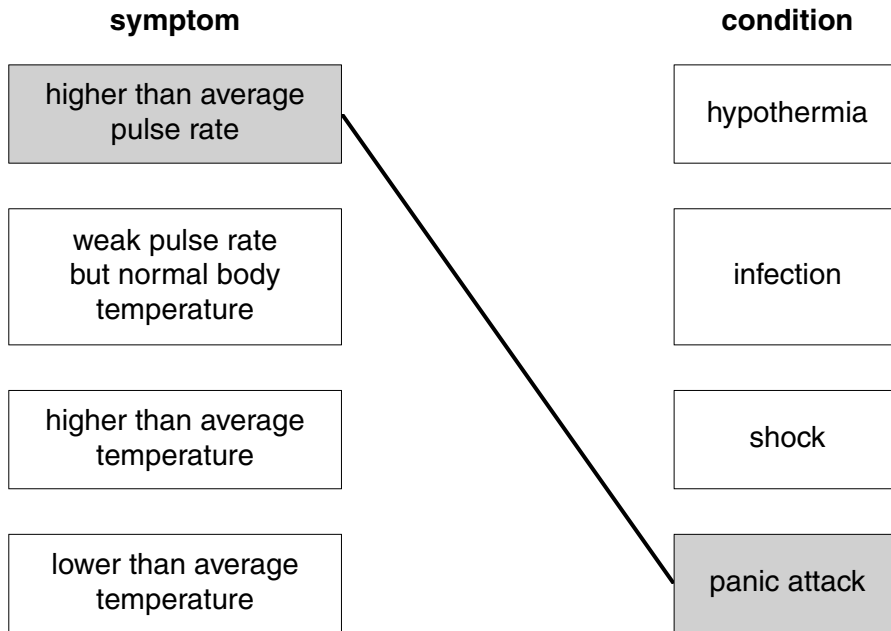
[2]

[Total: 10]
 Turn over

2 Hyat is a paramedic.
He is trained to link certain symptoms with a likely condition.

(a) The lists show symptoms and conditions.

Draw a line from each **symptom** to the most likely **condition**.
One has been done for you.



[2]

(b) Hyat has to prioritise people for emergency treatment.
Describe how Hyat would decide who to treat first.

.....

.....

..... [2]

(c) Hyat treats the symptoms but does not necessarily cure the problem.
Describe an example to show the difference between treating the symptoms and curing a problem.

.....

.....

..... [2]

[Total: 6]

- 3 Tim enjoys mountain biking.
He is taking part in a tour across mountains in Africa.



Tim is hot. He sweats to help him cool down.

- (a) Explain how sweating helps to cool Tim down.

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

- (b) Explain how changes in the blood vessels in Tim’s skin could also help to cool him down.

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

- (c) Tim will use a lot of energy.
He cycles for 8 hours a day.
He uses 1100 joules per hour.

Rudi drives the back-up vehicle.
He also drives for 8 hours a day.
He only uses 360 joules per hour.

- (i) Calculate how much **more** energy Tim will need for a day’s ride.
Show how you work out your answer.

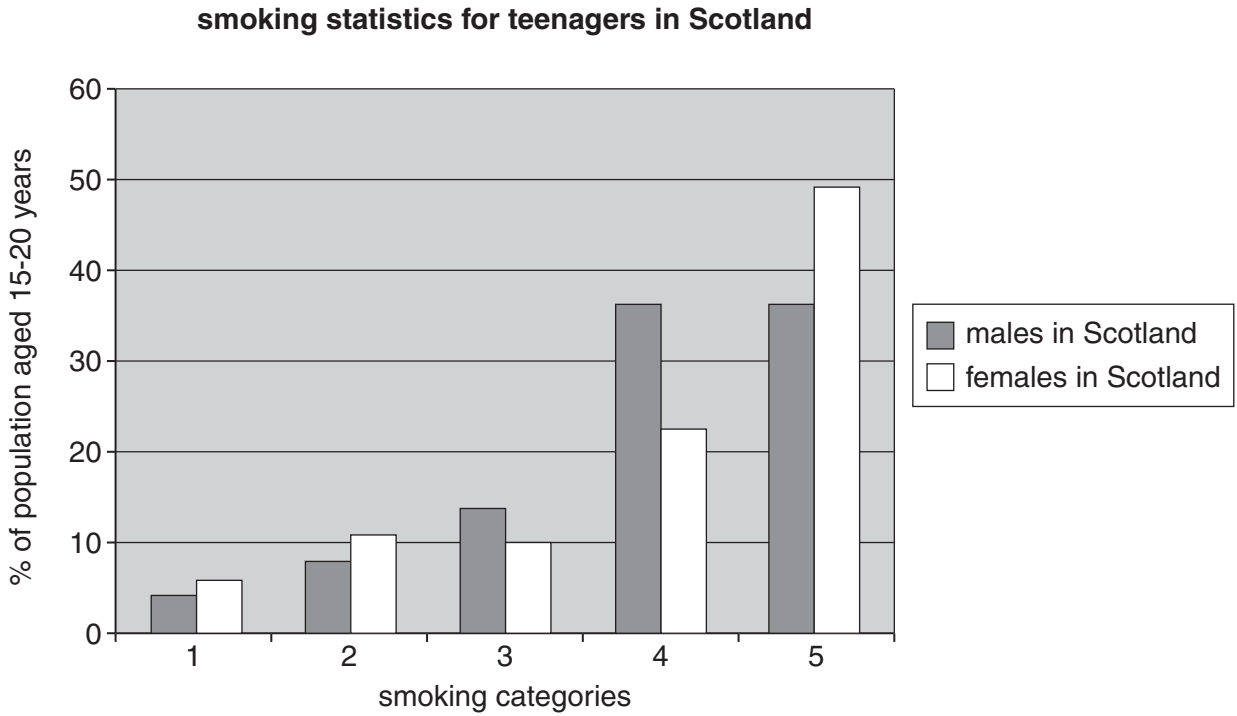
..... Joules [2]

(ii) Describe a suitable diet Tim would use to improve his fitness for the cycling tour.

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

[Total: 9]

4 The chart gives smoking statistics for teenagers in Scotland.



Key

- 1 smokes between 1–9 cigarettes a day
- 2 smokes between 10–19 cigarettes a day
- 3 smokes 20+ cigarettes a day
- 4 ex-smokers
- 5 have never smoked

(a) Scotland plans to introduce an anti-smoking campaign. Which category of smokers should be targeted to make the campaign effective. Explain your answer.

.....

.....

.....

..... [3]

(b) Anti smoking campaigns can cost lots of money. Explain why, despite the fact that some people still smoke, these campaigns may prove to be cost effective in the long term.

.....

.....

.....

..... [3]

[Total: 6]
Turn over

5 Kalif is in hospital recovering from a suspected heart attack. Tests show that some of Kalif’s arteries are becoming blocked. A heart by-pass operation could overcome the blocked arteries. This is a major operation.

(a) The risk of this operation has to be assessed and discussed with Kalif. Explain why.

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

(b) Explain why it is essential to keep accurate records during Kalif’s treatment.

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

[Total: 5]

END OF QUESTION PAPER



Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (OCR) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

OCR is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.