Candidate forename		Candidate surname	

Centre number						Candidate number				

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

GCSE

A324/02

TWENTY FIRST CENTURY SCIENCE

ADDITIONAL APPLIED SCIENCE A

Life Care (Higher Tier)

THURSDAY 26 JANUARY 2012: Morning
DURATION: 45 minutes

SUITABLE FOR VISUALLY IMPAIRED CANDIDATES

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)

READ INSTRUCTIONS OVERLEAF

DC (SM/SW) 12MEP01029 55222/2
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INSTRUCTIONS TO CANDIDATES

- **Write your name, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.**
- **Use black ink. HB pencil may be used for graphs and diagrams only.**
- **Answer ALL the questions.**
- **Read each question carefully. Make sure you know what you have to do before starting your answer.**
- **Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).**

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.**

BLANK PAGE

Please turn over for Question 1.

Answer ALL the questions.

1 Saskia is a physiotherapist.
She designs exercise programmes to treat skeletal muscular injury.

(a) Saskia monitors her patient's progress during the programme.
Briefly describe one example of how she might do this.

_____

_____

_____ **[3]**

(b) Sometimes she has to change the exercise programme before it is completed.
Write down TWO reasons for changing a programme before it is completed.

1 _____

2 _____

[2]

(c) As a health and fitness practitioner, Saskia needs to have a number of specific personal qualities. Which of the statements best describe these qualities?
Put ticks (✓) in the boxes next to the THREE best answers.

Saskia is tactful. ☐

Saskia is very good at biology. ☐

Saskia has lots of friends who are famous sports personalities. ☐

Saskia recognises the importance of team work. ☐

Saskia shows empathy. ☐

Saskia is very patient. ☐

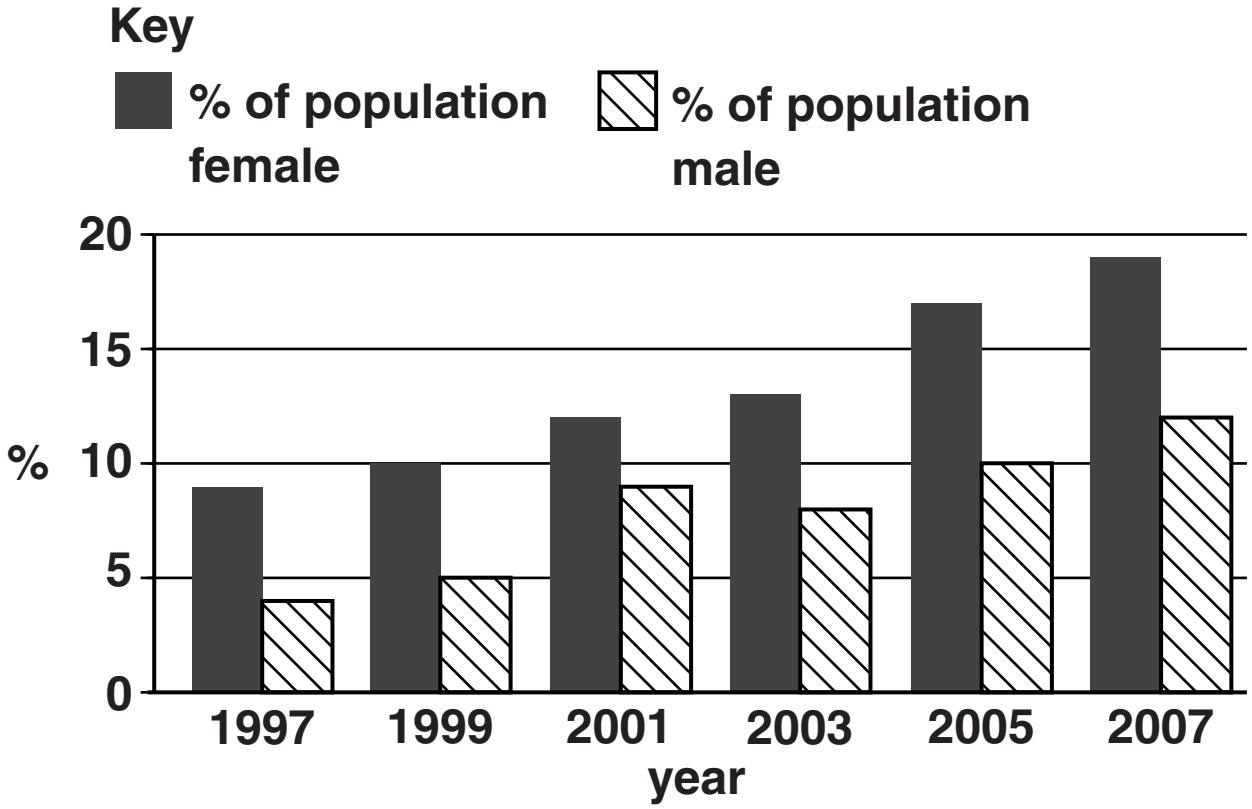
[3]

[Total: 8]

2 Tracy sees the following headline in a magazine.

Obesity – the greatest health threat facing the UK

She reads on and comes to this chart.
It shows the percentage (%) of women and men aged 16–25 in the obese category as measured by their BMI (body mass index).



(a) (i) Describe the overall trend for women shown in the chart.

_____

_____ **[1]**

(ii) There were 3.5 million females in this age range in the UK in 2001.
Use information from the chart to calculate how many of these females were obese.

_____ **[1]**

(b) Tracy is 20 and worried that she is obese.
Tracy is 2.0 m tall and has a mass of 124 kg.

(i) Calculate Tracy's BMI.

Use the formula $\text{BMI} = \dfrac{\text{mass kg}}{(\text{height m})^2}$

Show your working.

BMI = _____ [2]

(ii) The BMI categories are shown in the table below.

BMI	CATEGORY
less than 20	underweight
20–25	normal weight
25.1–29.9	overweight
30 and over	obese

Which category does this put Tracy in?

_____ **[1]**

(c) Tracy decides to join her local fitness centre. She is asked questions about her LIFESTYLE. Write down THREE lifestyle questions she should be asked before she can join.

1 _____

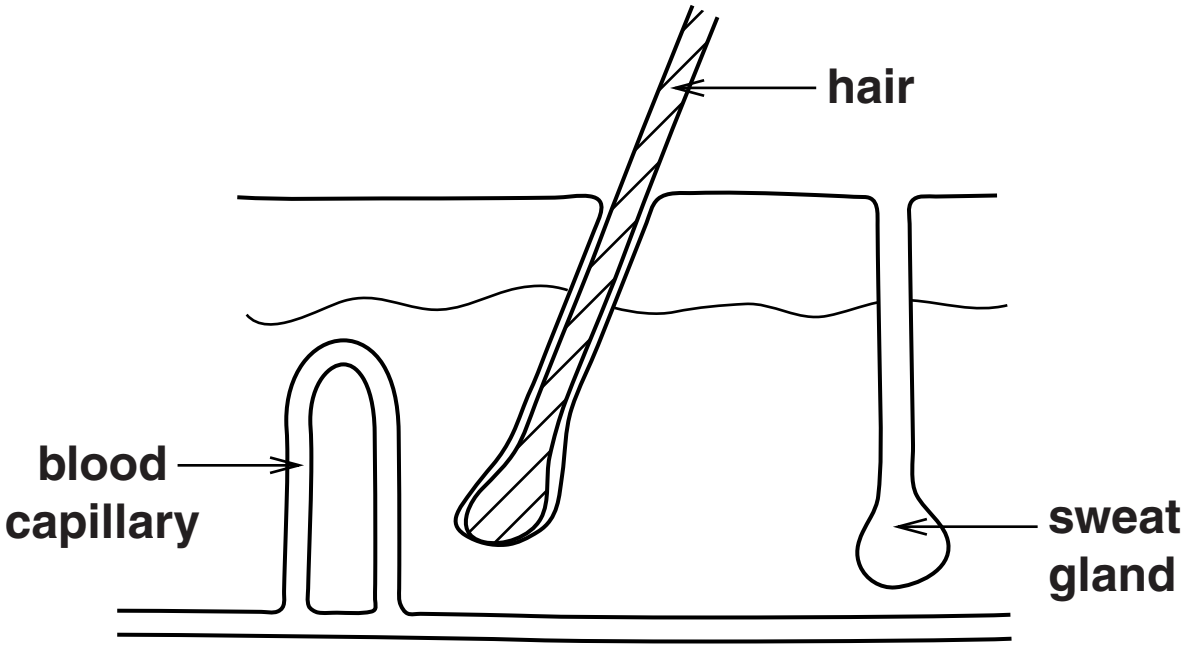
2 _____

3 _____

[3]

[Total: 8]

3 Ralph is on holiday.
He sits in the sun and becomes too hot.
The diagram shows a section through his skin.



(a) Describe how Ralph's body responds to becoming too hot.
Use the diagram of Ralph's skin and your knowledge of the body's response to temperature change in your answer.

_____

_____

_____ **[3]**

(b) When Ralph returns from his holiday he is worried by a lump on his skin.
He goes to see his GP and is referred to a specialist.
The specialist needs to test the cells in the lump.
Explain what must happen before the specialist can do any diagnostic tests.

_____

_____ **[2]**

(c) Once a diagnosis has been made, Ralph may need the specialist to provide a course of drug therapy.
Describe an example of this type of drug therapy that you are familiar with.

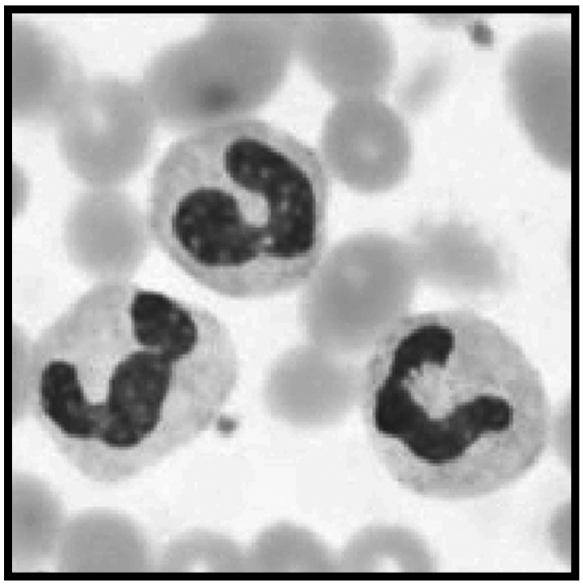
_____

_____ **[2]**

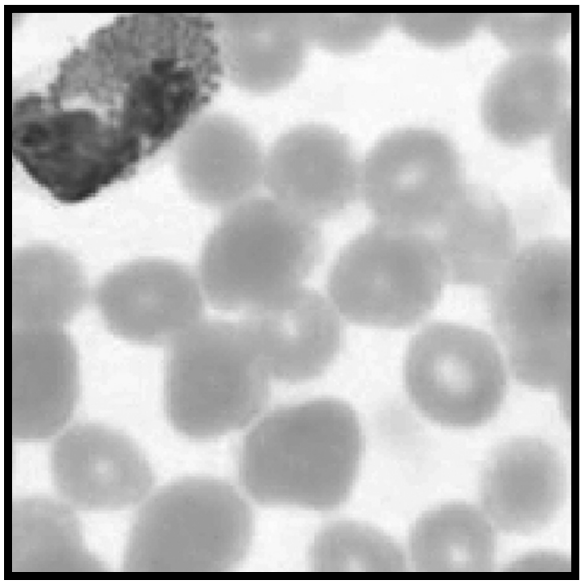
[Total: 7]

4 (a) **Otis works in a hospital pathology laboratory. He tests samples of blood and urine taken for analysis.**
The diagram shows three of the blood samples.

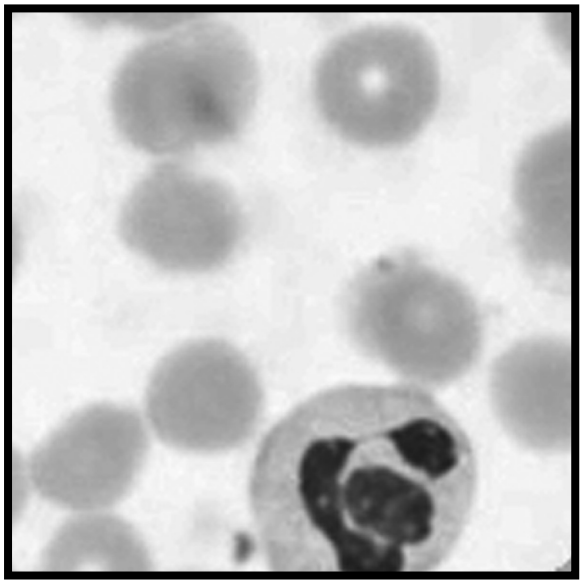
A



B



C



Otis identifies one sample as normal, one as anaemic and one as infected.
The anaemic sample has fewer red blood cells than normal.
The infected sample has more white blood cells than normal.
Complete these sentences using the letters A, B or C.

Sample _____ is normal.

Sample _____ is anaemic.

Sample _____ is infected.

[1]

(b) Write down THREE OTHER types of samples, apart from blood or urine, that may be sent to Otis for testing.

1 _____

2 _____

3 _____

[3]

(c) Otis finds that one of the samples indicates kidney problems.
Describe the function of the kidneys.

_____

_____

_____ **[2]**

[Total: 6]

5 (a) Anita is pregnant.
Name the substance present in her urine which shows she is pregnant.

_____ **[1]**

(b) Anita visits her midwife regularly and looks through health education information at the clinic. She discovers that the length of pregnancy can vary and can be affected by smoking.
The table shows how the mass of babies at birth can change with the length of the pregnancy in smoking and non-smoking mothers.

LENGTH OF PREGNANCY IN WEEKS	MEAN BIRTH MASS / kg (NON-SMOKER)	MEAN BIRTH MASS / kg (SMOKER)
36	2.5	2.4
37	2.7	2.5
38	2.9	2.7
39	3.1	3.0
40	3.3	3.1
41	3.4	3.2
42	3.5	3.3
43	3.6	3.4

(i) Use the data to describe the similarities and differences in mean birth mass in smokers and non-smokers over the period shown.

_____

_____

_____

_____ **[3]**

(ii) Anita is trying not to smoke during her pregnancy because she is worried about her baby.
Use the data in the table and your knowledge of health education programmes to explain why, despite the expense, such programmes may be cost effective in the long term.

_____

_____

_____

_____

_____ **[3]**

[Total: 7]

END OF QUESTION PAPER

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