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Centre Number						Candidate Number				
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**OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GENERAL CERTIFICATE OF SECONDARY EDUCATION**

A324/02

**TWENTY FIRST CENTURY SCIENCE
ADDITIONAL APPLIED SCIENCE A**

Life Care (Higher Tier)

MONDAY 18 JANUARY 2010: 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

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes on the first page.
- 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.
- 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.

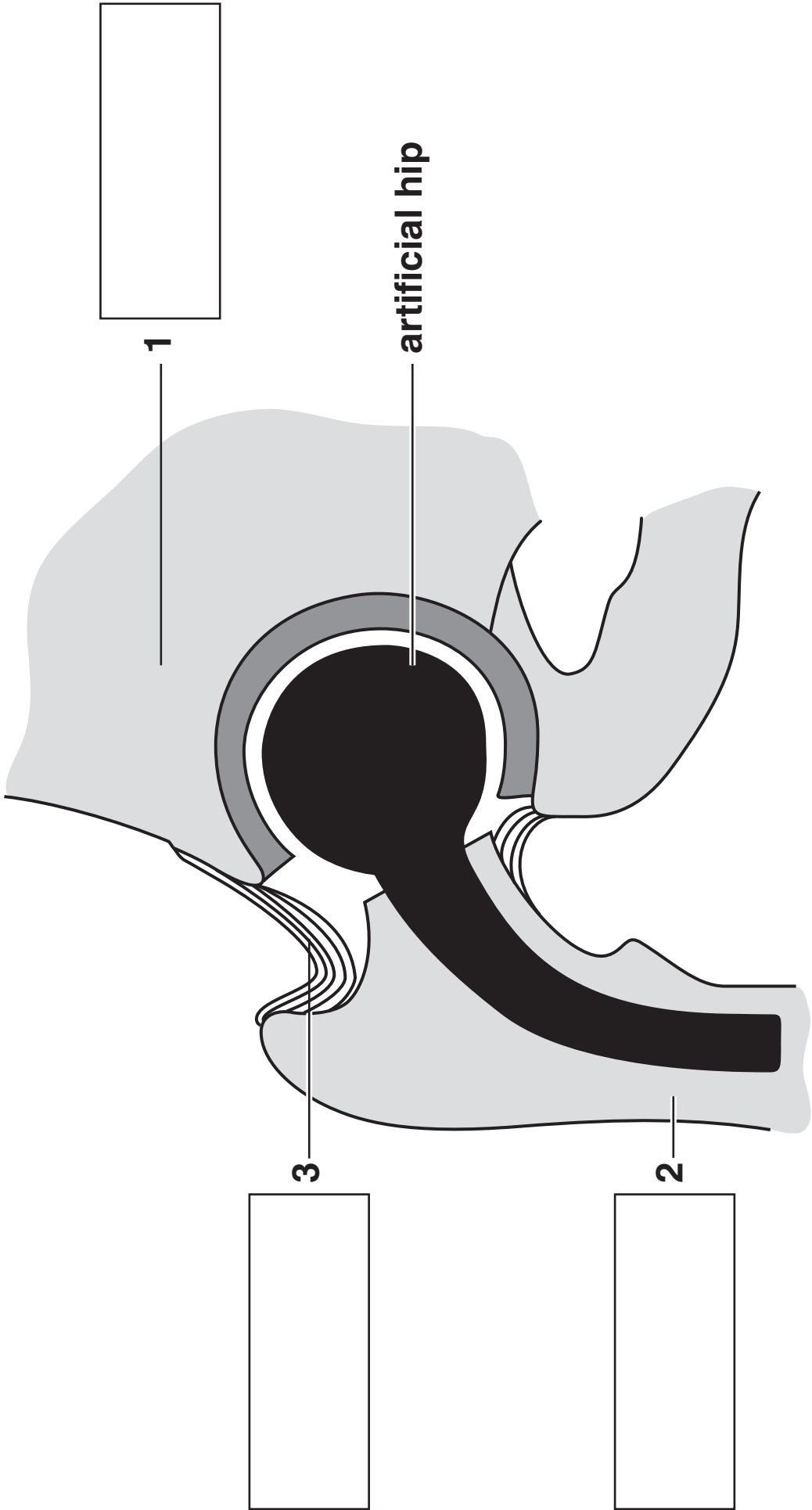
BLANK PAGE

Answer ALL the questions.

**1 Margie's hip hurts when she walks.
Her doctor thinks she needs an operation to replace a
hip joint.**

**(a) The diagram on the page opposite shows where a
new hip joint would fit.**

Complete the labels on the diagram. [3]



(b) Margie’s doctor refers her to the local hospital.

At the hospital a non-invasive technique is used to look at her hip joint.

(i) Name ONE non-invasive technique that could be used.

_____ [1]

(ii) Explain why non-invasive instead of invasive techniques are used whenever possible.

_____ [2]

(c) The specialist examines the results and explains the options available to Margie. Explain why Margie should consider carefully whether to have the operation or not.

_____ [2]

[Total: 8]

**2 Sam and Farouk join their local gym.
They are both 16 year old boys.**

They answer a LIFESTYLE questionnaire to help their personal trainer.

(a) (i) Give TWO different factors the questionnaire should ask about.

1 _____

2 _____ [2]

(ii) For each factor, explain why the information is needed.

1 _____

2 _____

_____ [2]

(b) A step test is designed to assess aerobic fitness. Both boys complete a step test. Here are their results.

NAMES	LENGTH OF TEST IN SECONDS	PULSE RATE 1	PULSE RATE 2	PULSE RATE 3
Farouk	300	80	70	65
Sam	300	124	100	76

$$\text{The test score} = \frac{\text{length of test in seconds} \times 100}{(\text{pulse 1} + \text{pulse 2} + \text{pulse 3}) \times 2}$$

This gives Farouk a score of 70.

**(i) Calculate the test score for Sam.
Show your working.**

Score is _____ [2]

- (ii) Farouk's girlfriend has a step test score of 64. The chart shows how the score relates to aerobic fitness.

MALE SCORE	FEMALE SCORE	FITNESS LEVELS FOR 16 YEAR OLDS
over 90	over 86	excellent
80-90	76-86	above average
65-79	61-75	average
55-64	50-60	below average
below 55	below 50	poor

Use the chart to work out the fitness levels of Farouk and his girlfriend.

Farouk _____

Farouk's girlfriend _____

[1]

- (iii) Describe ONE example of an exercise programme that could be used to improve Sam's fitness.**

[2]

- (iv) Suggest ONE reason why Sam's programme may need modifying before completion.**

[1]

[Total: 10]

**3 Ramona is pregnant.
Her body has changed a lot during pregnancy.**

(a) Describe TWO of these changes and explain the reason for them.

1 _____

2 _____

_____ **[2]**

(b) Ramona has regular check-ups with her midwife.

The midwife takes a blood sample.

(i) Describe how a blood sample is taken.

_____ **[3]**

(ii) Ramona had a blood test early in her pregnancy.

This confirmed she was pregnant.

Suggest one OTHER diagnosis that might be obtained from a blood test.

_____ **[1]**

- (iii) The midwife also takes a urine sample from Ramona.
Suggest one OTHER diagnosis that might be obtained from testing this sample.**

_____ [1]

- (c) Ramona has a scan.
It shows that her baby might have a spinal abnormality.
She will need to have a diagnostic test to check the baby.**

- (i) What sort of scan would Ramona have?**

_____ [1]

- (ii) Explain why the risk to Ramona must be assessed before further tests are carried out.**

_____ [2]

[Total: 10]

4 The National Health Service in England employs more people than any other organisation in Europe. Which THREE of the following features best describe the aims of the National Health Service?

(a) Put ticks (✓) in the THREE correct boxes.

to advertise new drugs

to allocate resources when and where they are needed

to make health care available to all citizens

to monitor national health trends

to promote pregnancy testing

to test out new medicines

[3]

(b) The following newspaper headline suggests we are a nation of binge drinkers.

HOSPITALS ADMIT 500 BINGE DRINKERS EACH DAY

The 24 hour drinking laws and increased availability of cheap alcohol are causing a problem.

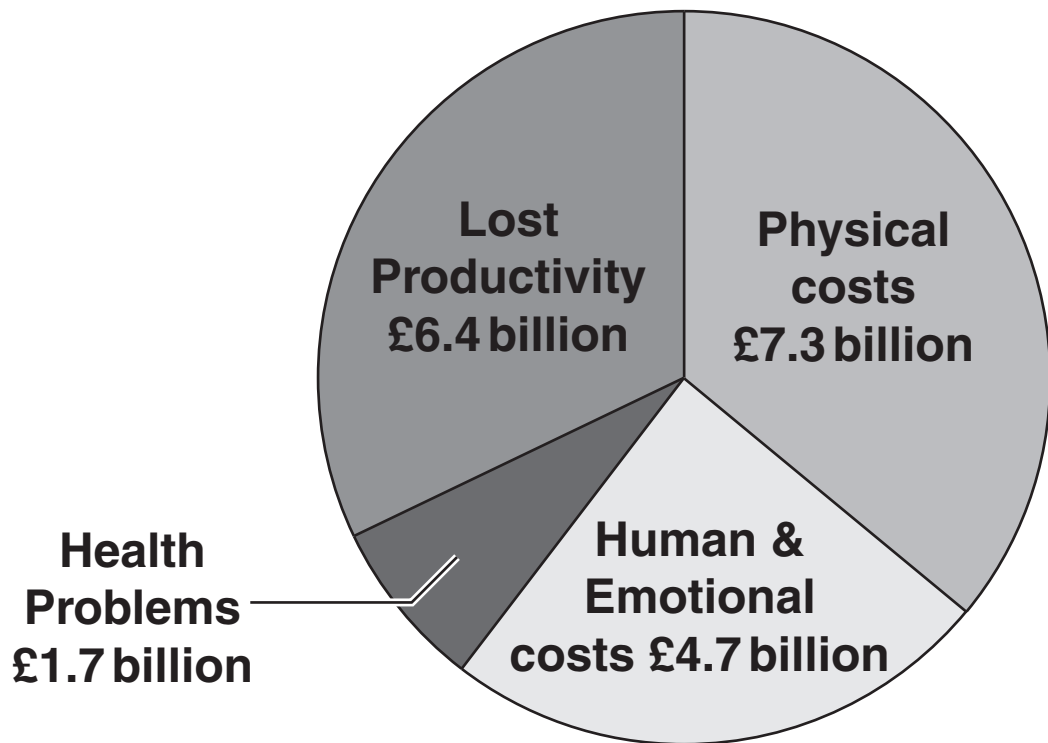
There is a huge increase in the number of alcohol related hospital admissions due to accidents and dangerously high levels of alcohol in the blood.

The government is worried about this trend. It is providing extra money for the National Health Service.

Explain why ALL the extra money will not be spent on the treatment of alcohol related health problems.

[2]

(c) Government statistics show the costs to society of alcohol abuse.



(i) Calculate the overall cost to society of alcohol abuse.

answer _____ [1]

(ii) Suggest and explain one OTHER way the government could try to reduce the cost to society of alcohol abuse.

[2]

[Total: 8]

END OF QUESTION PAPER



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