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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)

WEDNESDAY 9 JUNE 2010: Afternoon

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. 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.

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Answer ALL the questions.

- 1 (a) Colin is training as a swimmer for the Olympic team.

His coach monitors his progress very carefully.

Sometimes the coach has to change the training programme.

The list shows some possible reasons.

Which reasons would cause the coach to change Colin's programme?

Put ticks (✓) in the boxes next to the THREE best reasons.

Colin has pulled a muscle in his back.

The water temperature is only 25°C.

Colin had too much alcohol at a party last night.

Colin is not winning any competitions he enters.

Colin has had a tattoo on his shoulder.

Colin has just returned from a two week holiday.

[2]

(b) Colin's coach needs to time his performance.

He needs to consider

- **ACCURACY of the timing method**
- **RELIABILITY of the data obtained.**

Explain what is meant by

ACCURACY

RELIABILITY

[2]

[Total: 4]

2 Monisha works in the microbiology department of a hospital.

She tests samples from the body such as blood and faeces for the presence of microbes.

(a) Name TWO OTHER samples from the body she might test.

1 _____

2 _____

[2]

(b) The hospital has an outbreak of C. difficile which causes severe diarrhoea.

C. difficile is not killed by hand gels, only by soap and water.

It spreads from person to person very quickly and may cause death.

Monisha analyses the samples for C. difficile but it takes a long time.

She hears about a new, quicker, method using a machine.

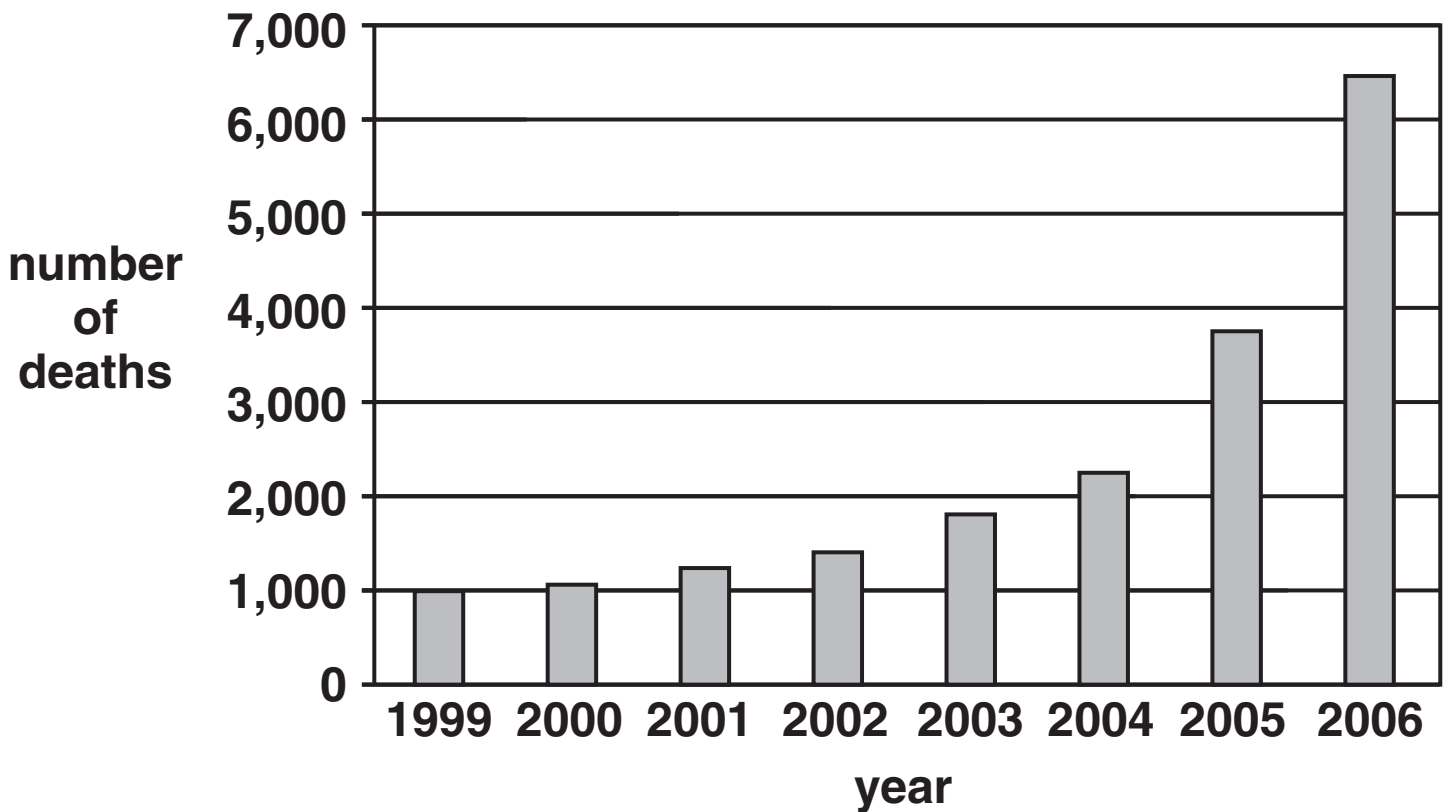
The machine chemically ‘sniffs’ the diarrhoea (faeces).

If C. difficile is present, the smell is identified in minutes.

Explain the advantages of having a QUICKER method of identifying C. difficile.

[2]

(c) The chart shows the number of deaths caused by *C. difficile* infection over an eight year period.



The Government was concerned about this trend.

In 2006 they passed a Health Act requiring all hospitals to have systems in place to ensure effective infection control.

(i) Suggest, WITH A REASON, what you would expect to have happened to the figures for 2007.

[1]

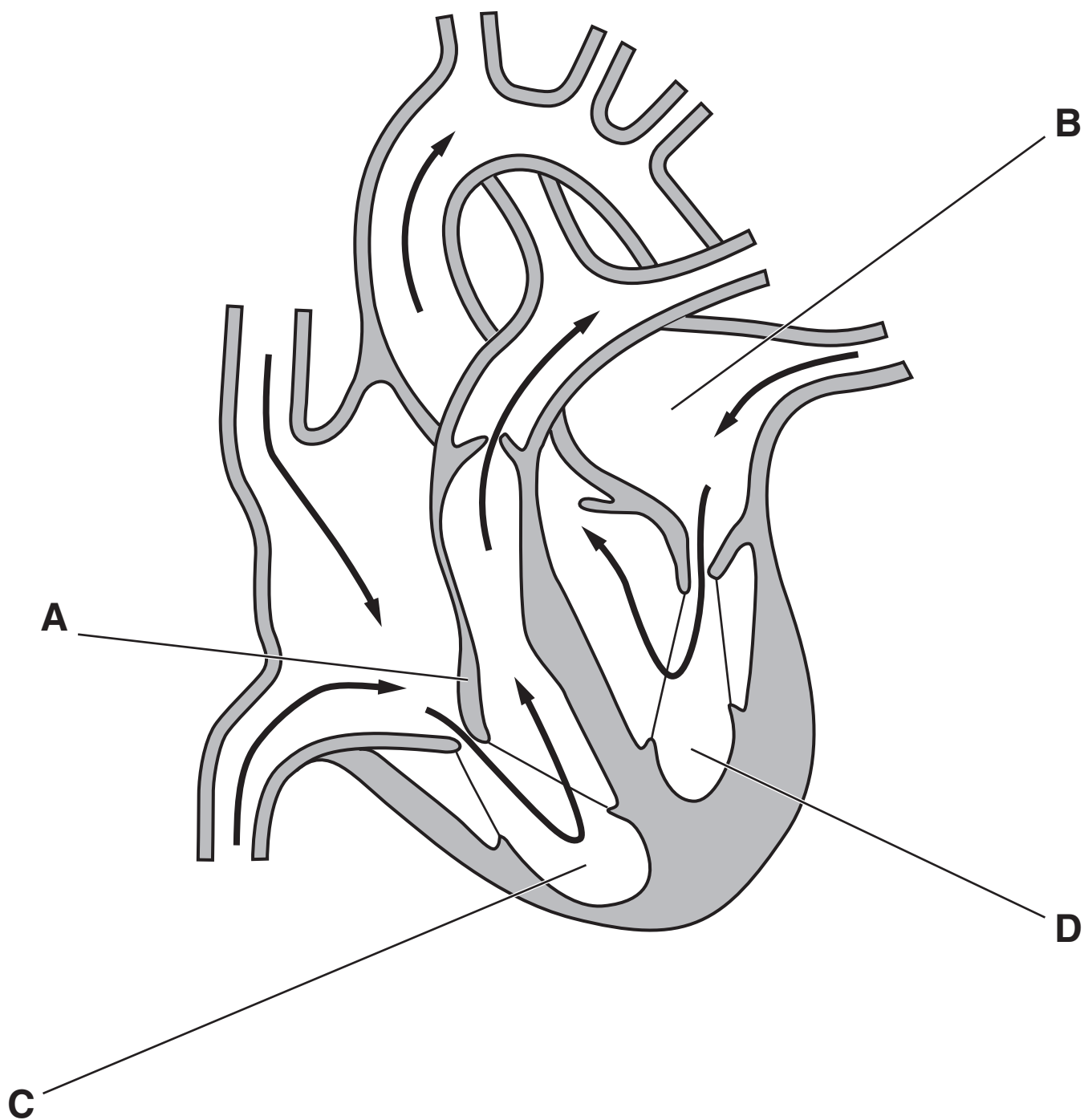
(ii) Explain why it may not be possible for hospitals to spend more of their funds to provide better infection control measures.

[2]

[Total: 7]

3 This question is about the heart and blood vessels.

(a) Look at the diagram of the heart.



Name the parts of the heart labelled A, B, C and D.

A _____

B _____

C _____

D _____

[2]

(b) The diagram also shows arteries and veins.

Explain the differences in STRUCTURE and FUNCTION of an artery and a vein.

[2]

[Total: 4]

4 Botox is now called the ‘lunch-hour’ face lift, but is it safe?

The table gives reasons for and against.

FOR	AGAINST
Botox was licensed for cosmetic use in 2002.	Botox is a diluted poison which can cause paralysis.
Large numbers of people continue to use botox and many have repeat treatments.	Botox injections can affect how a person blinks and eats.
Botox can remove wrinkles for 3 – 4 months.	Side effects can include droopy eyebrows, partly closed eyelids and headaches.

People must give their informed consent BEFORE they receive treatment.

Give THREE reasons why.

Use information in the table to help with your answer.

[3]

[Total: 3]

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5 (a) Football can be a dangerous game.

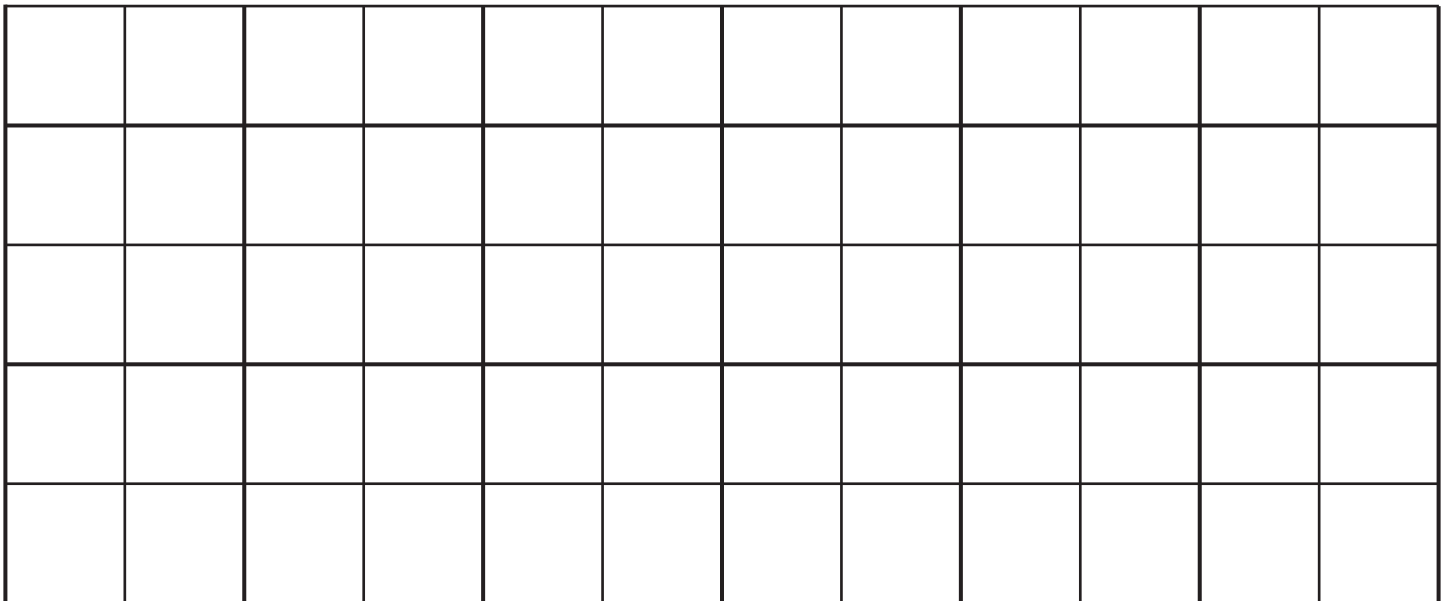
The table shows the injuries sustained in the English Premier League in 2008.

TYPE OF INJURY	NUMBER OF PLAYERS WITH THE INJURY
neck	2
shoulder	3
thigh muscle	4
broken leg	2
knee	20
ankle / foot	9

Plot this data as a bar chart on the grid below.

- choose a suitable scale
- label the axes
- label the bars

You are advised to use a ruler and sharp pencil.



[3]

(b) The percentage (%) of injured players can be calculated using the following formula.

$$\text{percentage} = \frac{\text{number of players with that injury}}{\text{total number of injured players}} \times 100$$

Use the equation to find the percentage of injured players with KNEE injuries.

Show your working.

_____ % [2]

(c) There are two main types of knee injury.

One involves damage to the knee ligaments.

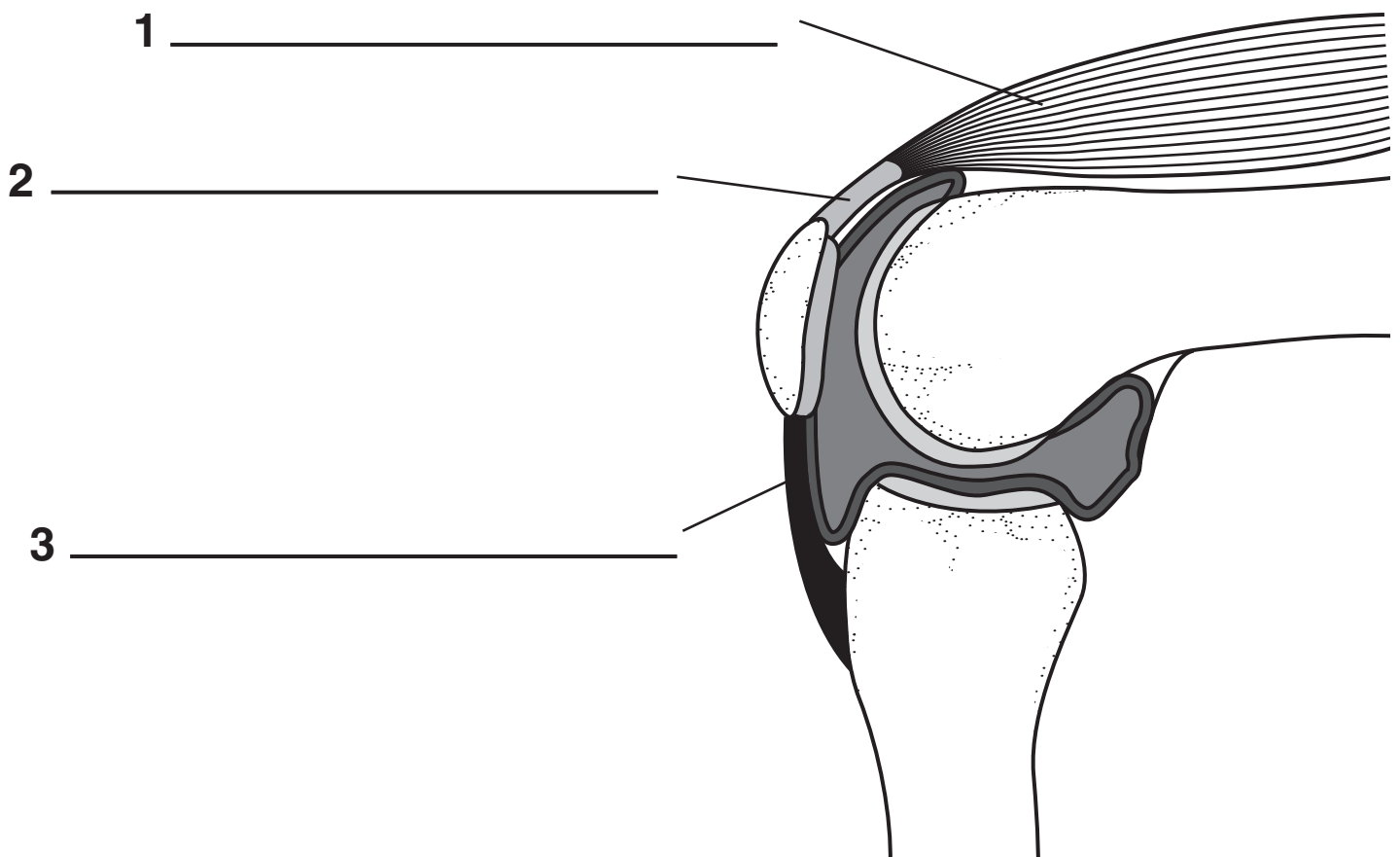
The other involves damage to the knee tendons.

(i) Name ONE non-invasive technique that could be used to show the damage to a footballer's knee.

_____ [1]

(ii) The diagram shows a footballer's knee joint.

Complete the labels on the diagram.



[3]

(iii) Describe the difference between ligaments and tendons.

[2]

[Total: 11]

6 (a) Adanna has a lump in her breast.

Her doctor refers her to a specialist who wants to do some diagnostic tests.

Explain why the risk to Adanna must be assessed before any diagnostic test is carried out.

[2]

(b) The tests show she has breast cancer.

Adanna needs surgery to remove the lump, followed by drug therapy.

Briefly describe ONE example of drug therapy that is used to improve health or fitness that you have studied.

[2]

(c) Adanna has found out about a new drug to treat breast cancer, on the internet.

The specialist will not give it to her because her PCT (Primary Care Trust) does not allow its use for early stage breast cancer.

Adanna cannot understand why. The PCT is part of the National Health Service and its job is to make health care available to all citizens.

Use your knowledge of the National Health Service to justify the PCT's decision.

[3]

[Total: 7]

END OF QUESTION PAPER



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