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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 17 JANUARY 2011: 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, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **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).**
- **Answer ALL the questions.**

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 Jennie and Nisha join their local health club.
They fill in a lifestyle questionnaire.
They both want to lose weight and become fitter.
The fitness trainer measures their height and body mass.
He calculates their BMI (body mass index).**

**Jennie is 72 kg and 1.6 m tall.
Her BMI is 28.1.**

- (a) Nisha is 45 kg and 1.5 m tall.
Calculate Nisha's BMI.
Use the formula**

$$\text{BMI} = \frac{\text{mass in kg}}{(\text{height in m})^2}$$

Show your working.

BMI is _____ [2]

The table gives information about interpreting BMI.

BMI	CONDITION	ADVICE GIVEN
under 20	underweight	may need to gain weight
20.0–24.9	advisable range	
25.0–29.9	overweight	some weight loss may be beneficial to health
30.0–34.9	obese	need to lose weight
35 & over	severely obese	urgent need to lose weight; consult a doctor

- (b) The girls have two friends, Ronan and John.
Ronan has a BMI of 27.2.
John has a BMI of 19.5.

The fitness trainer advises Ronan and John to follow different fitness programmes.
Suggest and explain why.

[2]

(c) Briefly describe ONE way the fitness trainer could monitor progress during fitness training.

[2]

(d) Write down TWO possible reasons for modifying a fitness programme before it has been completed.

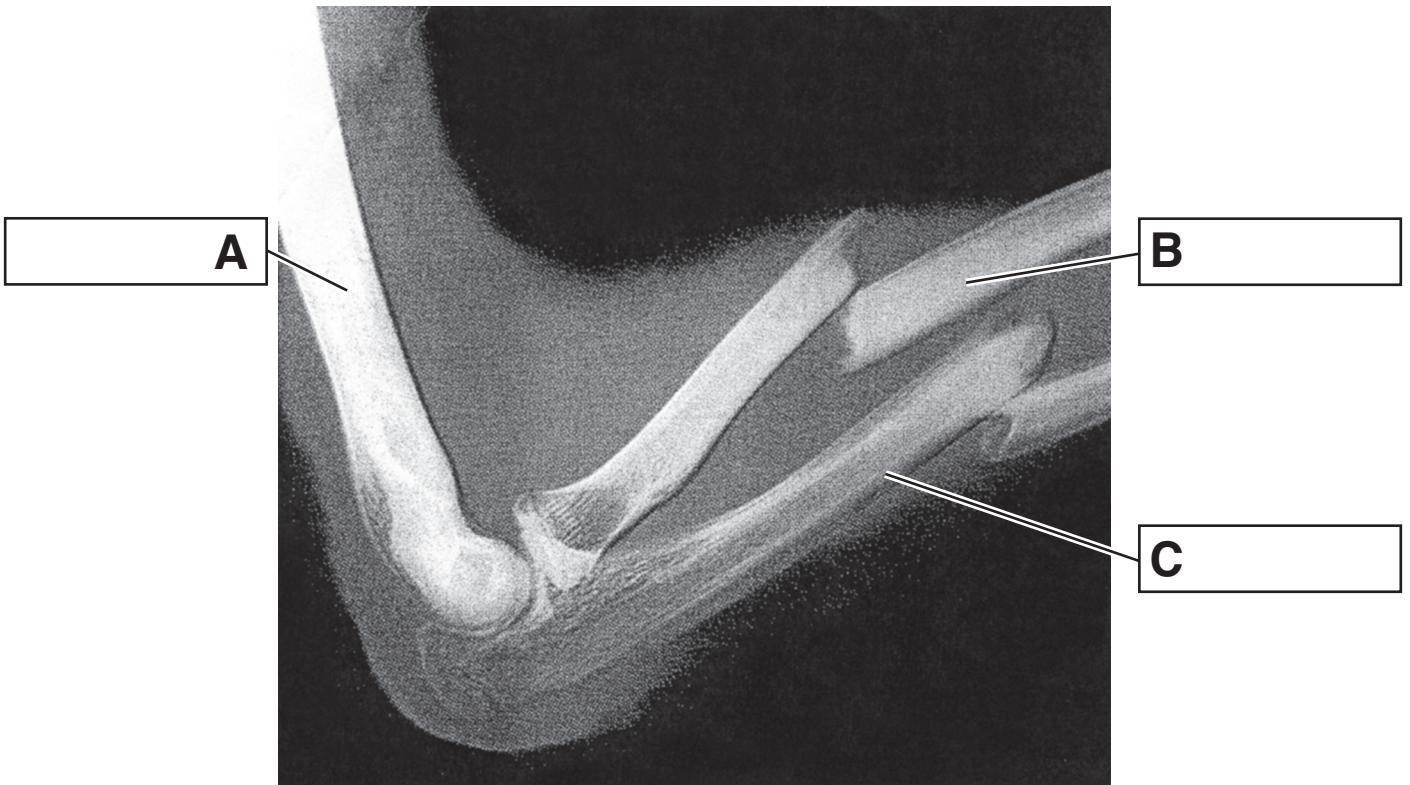
1

2

[2]

[Total: 8]

- 2 (a) Ben has broken two bones in his arm.
The picture shows the broken bones in Ben's arm.
Label the bones in the picture. [3]



- (b) Give the name of the medical imaging technique used to produce the picture of the bones in Ben's arm.

_____ [1]

Ben does some research about the human skeleton.

- (c) Write down **THREE** functions of the human skeleton.

1 _____

2 _____

3 _____ [3]

**(d) Ben's bones break very easily.
The doctor thinks that Ben does not have enough vitamin D.
The lists show INFORMATION about vitamin D and possible CONSEQUENCES of vitamin D deficiency.**

**(i) Draw a straight line to link each piece of INFORMATION to the correct CONSEQUENCE.
One has been done for you. [2]**

INFORMATION

vitamin D helps the body use calcium to make strong bones

vitamin D is stored in the body for up to 60 days

vitamin D is contained in fish oil

90% of vitamin D is made in the skin using sunlight

CONSEQUENCE

vegetarians may be low in vitamin D

people using sunscreen or covering-up in the sun are likely to be low in vitamin D

insufficient vitamin D can cause rickets (soft bendy bones)

people living in the north of England are likely to be low in vitamin D by the end of the winter

Use the information in the boxes together with your understanding of health care to answer the following question.

- (ii) Suggest what advice Ben’s doctor could give him to help improve his bones.**

_____ [1]

- (iii) Describe and explain ONE advantage and ONE disadvantage of the advice you have chosen.**

advantage _____

disadvantage _____

_____ [2]

[Total: 12]

3 Read this newspaper story.

Contagious Cruiser Cast-off!

An outbreak of swine flu has been confirmed on board the cruise liner *Osear*. The port authorities have refused the liner permission to dock, insisting that the crew and passengers remain on board, in quarantine. Swine flu is an infectious disease caused by a virus. It is detected by collecting samples from the nose (nasal swabs), which are tested in a laboratory.

(a) Medical laboratories process many samples, including blood and urine.

(i) Write down TWO OTHER samples that could be taken for analysis.

1 _____

2 _____ **[2]**

(ii) Describe how a blood sample is taken.

_____ **[3]**

(iii) Give TWO examples of diagnoses that can be obtained from examination of blood samples.

1 _____

2 _____ **[2]**

The World Health Organisation (WHO) monitors international public health issues, such as swine flu. The WHO works closely with our National Health Service.

Our National Health Service makes health care available to all citizens and provides specialist care that is not available locally.

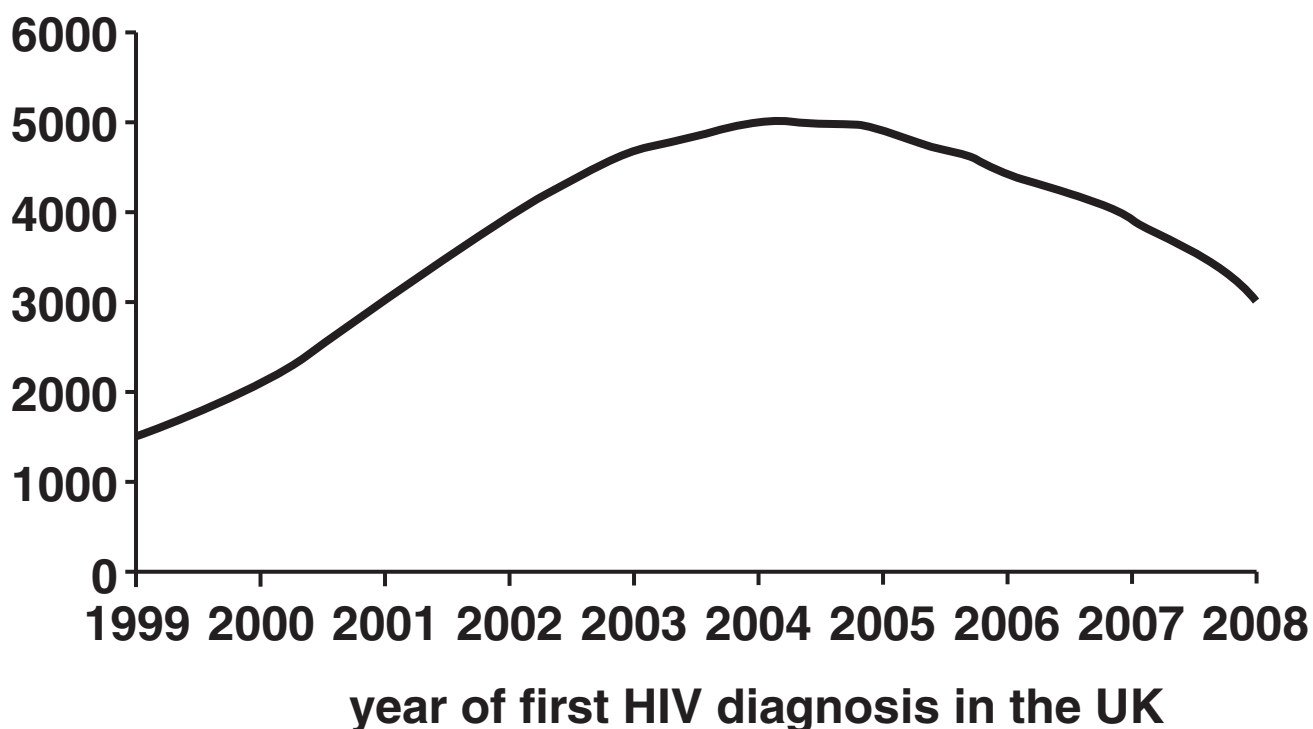
(b) Write down THREE OTHER features of a national health service.

_____ **[3]**

[Total: 10]

- 4 Public campaigns warning about the spread of HIV may be starting to take effect. The chart shows the number of HIV diagnoses in Britain over a period of 10 years.**

numbers of new HIV diagnoses



- (a) Use the information in the chart, together with your knowledge of public information programmes, to support the claim ‘Public campaigns warning about the spread of HIV may be cost effective in the long term’.**

[3]

(b) In certain parts of the world the number of people diagnosed with HIV is still increasing. Suggest reasons why.

[3]

[Total: 6]

END OF QUESTION PAPER

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