

Candidate Number:

The Institute of Animal Technology



CERTIFICATE EXAMINATION 2000

Section B - BACKGROUND SUBJECTS

Afternoon, Wednesday 7th June

(TOTAL TIME: TWO AND A HALF HOURS)

Part I

Short Answer Questions

Part II

Long Answer Questions

Write your candidate number at the top of this cover

Read the instructions for each part carefully

Part I

Short answer questions

Attempt ALL Questions

Write your answers in the spaces provided

Numbers in brackets indicate the marks available for each question

You are advised to spend approximately one hour on this part

***Hand in this book, together with your answers to Part II,
at the end of the examination***

Attempt ALL questions

1. State **three** environmental conditions necessary for life.

.....
.....
.....

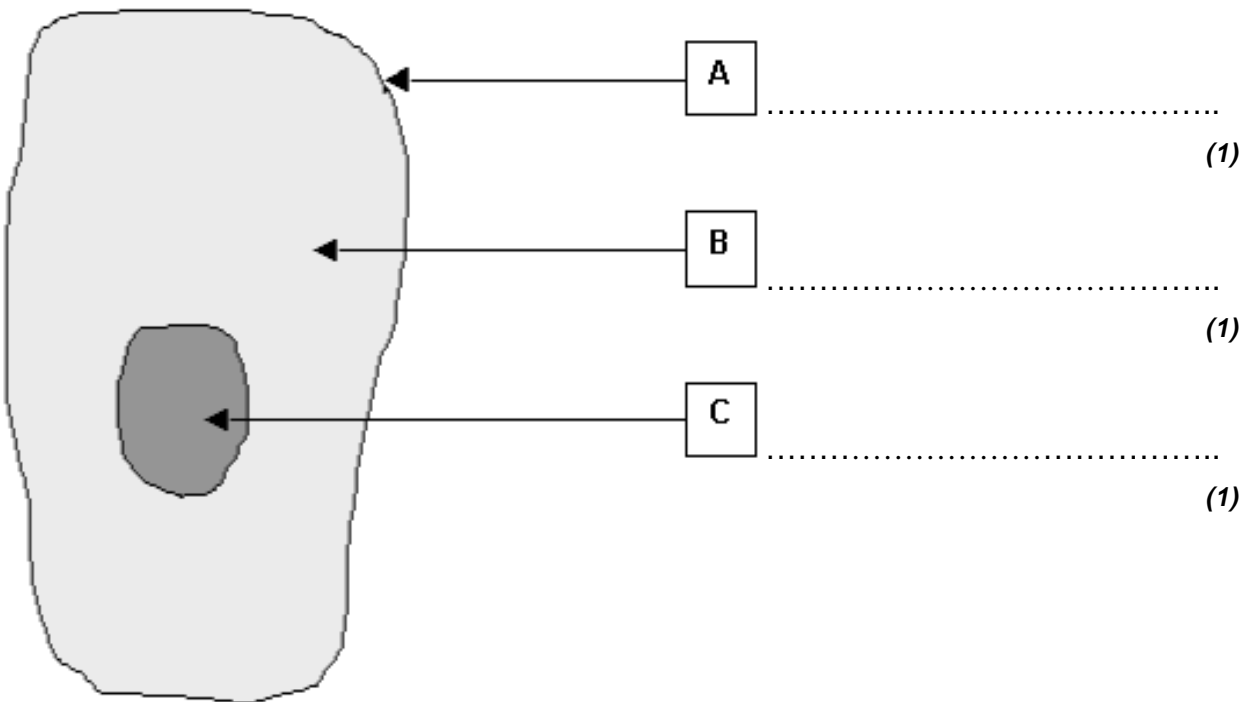
(3)

2. State **three** processes that characterise a living organism.

.....
.....
.....

(3)

3. Label the diagram below of an epithelial cell.



4. Explain why cell division in mammals is necessary.

.....
.....
(2)

5. In the table below, state the main functions of the following, giving a **different** answer for each.

	Functions
carbohydrates	
lipids	
proteins	

(3)

6. What is an enzyme?

.....
.....
.....
(3)

7. In what forms are the following nutrients absorbed in the body:

proteins (1)
carbohydrates (1)
lipids

.....
(2)

8. Give **two** functions of the spleen.

.....
.....
(2)

9. Give **two** functions of tissue fluid.

.....
.....
(2)

10. In the table below name a basic or derived SI unit and symbol for the following:

	SI Unit	Symbol
temperature		
sound		
light		
mass		
energy		

(5)

11. Name the **three** processes by which heat can be transferred.

.....
.....
.....
(3)

12. Define relative humidity.

.....
.....
.....
.....

(4)

13. Name **five** forms of energy.

.....
.....
.....
.....
.....

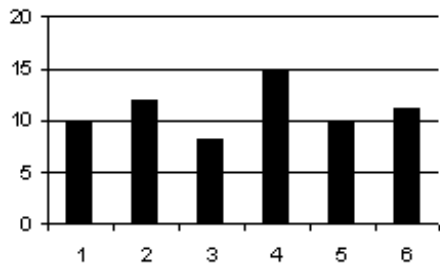
(5)

14. Name **three** instruments used for measuring temperature.

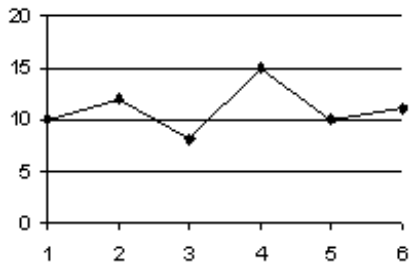
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(3)

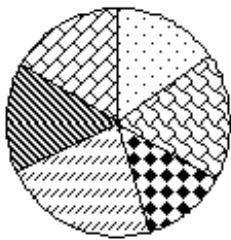
15. Name the following graph types:



A
(1)



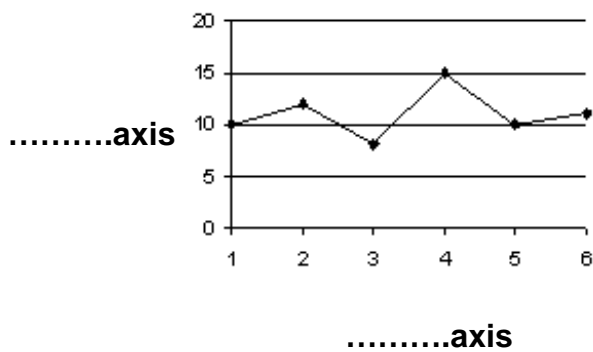
B
(1)



C
(1)

16. On the graph below, indicate the X axis and Y axis.

(1)



17. Complete the table below, putting the terms into standard form:

Unit	Standard Form
kilo	10^3
centi	
milli	
micro	

(3)

18. If $A = \frac{B \times C}{D}$

and $A = 242$
 $B = 22$
 $D = 4.$

What is the value of **C**?

Please show all workings

(4)

19. Define the following terms:

solution

.....
(2)

suspension

.....
(2)

colloid.....

.....
(2)

20. List **three** factors affecting the solubility of a solute in a solvent.

.....
.....
.....
(3)

21. In what **three** states do pure substances exist?

.....
.....
.....
(3)

22. Describe **three** differences between a compound and a mixture.

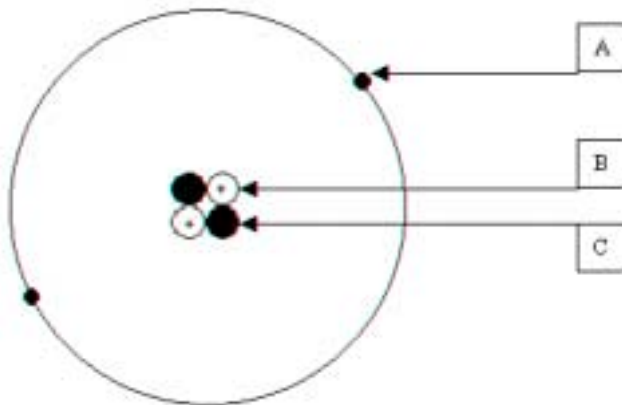
.....

.....

.....

(3)

23. The diagram below shows the atomic structure of an element.
Label the parts A, B and C.



.....

(1)

.....

(1)

.....

(1)

24. Define the term 'oxidation'.

.....

.....

(2)

In questions **25 & 26** below complete the statement by inserting the missing word in each space provided:

25. A detergent is a substance that will form a stable _____ between a _____ and a _____ substance. (3)

26. An acidic compound has a pH _____ 7 and yields _____ ions, whereas an alkaline compound has a pH _____ 7 and yields _____ ions. (4)

27. List **two** precautions to be taken when handling infected animals.
.....
..... (2)

28. List **two** methods by which infectious bedding material from animal sources can be made safe.
.....
..... (2)

29. What are the **two** responsibilities of employees under the Health and Safety at Work Act 1974?
.....
..... (2)

30. State **two** immediate actions to be taken on discovering a person unconscious as a result of an accident.

.....
.....

(2)

31. Which safety regulations cover the use of hazardous chemicals?

.....

(1)

32. Name the **three** common routes of entry of chemicals into the body.

.....
.....
.....

(3)

33. Complete the following statement by inserting the missing words in the spaces provided:

Flammable materials stored in bulk should be isolated from _____ compounds and kept geographically isolated in case of a _____. In animal units they should be kept in _____ quantities in a flame resistant cabinet. The bottles should be correctly _____ and kept well away from all sources of _____ e.g. refrigerators.

Chemical containers e.g. Winchesters should not be carried by the _____ but placed in a spill proof container with a _____. Cylinders of gas must be transported _____ on a correct size of trolley designed to prevent damage to the _____.

(9)

End of Part I

Part II

Long answer questions

***Attempt questions 1 and 2
and any TWO of the three
other questions***

Write your answers on the paper provided

Start each answer on a fresh sheet of paper

Write your candidate number in the top right hand corner and the question number in the top left hand corner of each answer sheet

***The percentages in brackets indicate the distribution
of the available marks***

Credit will be given for diagrams which make your answer clearer

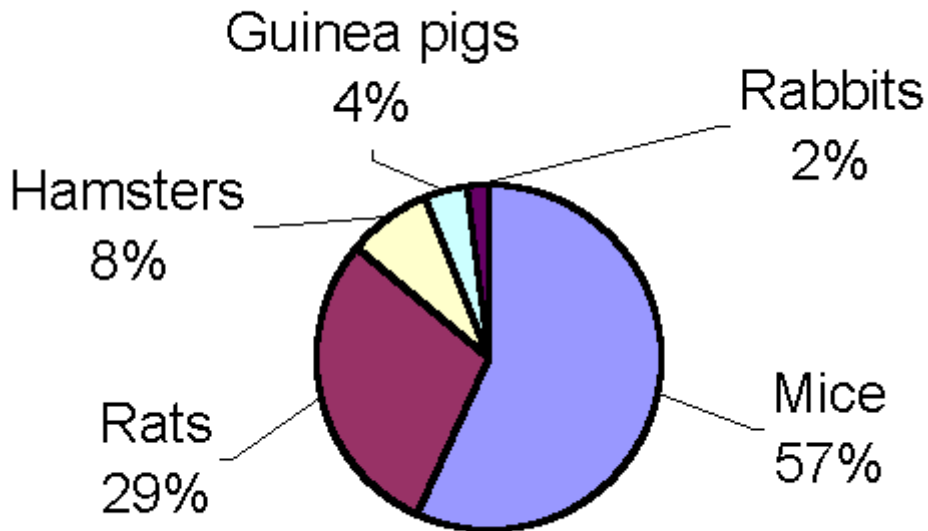
***You are advised to spend approximately 20 minutes on each
question***

***You must hand in all answer sheets together with this book
at the end of the examination***

Attempt both questions 1 and 2

FOR FULL MARKS YOU MUST SHOW YOUR WORKINGS

1.



- (a) The total number of animals held in this unit is 2000. Use the information provided in the graph above to state how many of each species there are.

40%

- (b) If one fifth of the guinea pigs are used and have to be replaced and

Guinea pigs cost £9.85 + VAT

Transport boxes (which hold 4 guinea pigs each) cost £6.35 + VAT

Delivery is £36.50 + VAT.

How many animals would be replaced and how much would the total bill be including VAT at 17.5%?

60%

2. You are required to disinfect a room in your unit using a fogger.

The disinfectant you need is to be mixed with water at 1 part disinfectant to 19 parts water and the fogger tank will hold 4.5 litres of mixture.

(a). What volume of:

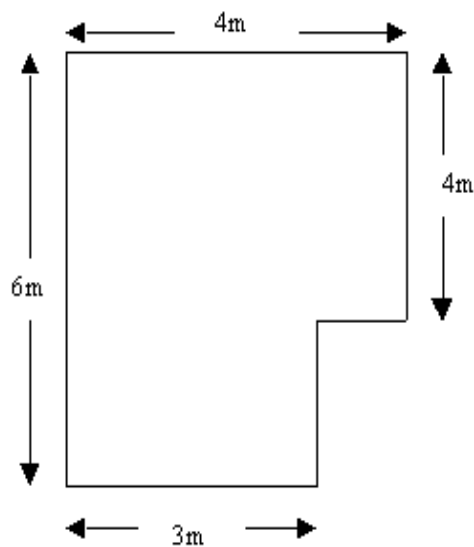
(i) disinfectant

(ii) water

will be required to fill the fogger?

40%

The room below is three metres high. Each cubic metre will require 65 cm^3 of mixture to disinfect it.



(b). What volume of the prepared solution will be required to disinfect the room?

30%

The fogger tank will use 5.4 litres of mixture per hour.

(c). To the nearest minute, how long will the fogger need to run for it to disinfect the room?

30%

Attempt TWO of these questions

- 3.** (a) The accompanying diagram shows the reproductive system of a male rat. In the spaces provided, label the structures indicated as **A – F**. **20%**
- (b) On a separate sheet, briefly describe the functions of each of the labelled structures. **80%**
- 4.** (a) Sketch and label a graph of a theoretical bacterial growth curve in a limited nutrient supply. (*Graph paper is not required for this*). **30%**
- (b) Give reasons for the variation in the growth rate with time. **40%**
- (c) An increase in mammalian cell numbers by cell division may alter the surface area : volume ratio of a tissue. Explain how it may increase or decrease this ratio. **30%**
- 5.** Compare the structure and function of arteries, veins and capillaries. **100%**

End of Part II

Question 3a

The Reproductive System of a Male Rat

- A _____
- B _____
- C _____
- D _____
- E _____
- F _____

