The Institute of Animal Technology



FELLOWSHIP EXAMINATION 2000

Section A - ANIMAL TECHNOLOGY

Morning, Wednesday 7th June

(TOTAL TIME: 3 HOURS)

Part I

Short Answer Questions

Part II & Part III

Long Answer Questions

Equal marks are allowed for each question

Write your candidate number in the top right hand corner of this cover sheet

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 half an hour on this part

Hand in this book, together with your answers to Parts II and III, at the end of the examination

Attempt all questions

1.	What is proximate analysis?	
		 (2)
2.	Explain the meaning of the following terms used in proximate analysis:	
	crude protein	
		 (1)
	ash	
		 (1)
	ether extract	
		 (1)
3.	Distinguish between expanded and non-expanded pelleted diets under th following headings:	าย
	mode of production of the pellets	
		 (2)
	microbiological load	
		 (2)
	palatability	-
		 (1)

4. Define the following:

	fixed formula diet	
		 (2)
	variable formula diet	
		 (2)
	semi-synthetic diet	
		(2)
	Which of fixed and variable formula diets is most commonly used for laboratory animals?	(-)
		(1)
	Why?	
		 (2)
	Give two advantages of using semi-synthetic diet.	(-)
		(2)
5.	Signs of cobalt deficiency are the same as signs of vitamin B12 deficie	ency.
	vvny ?	
	Describe these deficiency signs	(1)
	(3	x ½)

6. Newborn piglets housed indoors are given iron injections. Why is it not necessary to give them to piglets housed outdoors?

(2)

Name the condition that would occur if the injections were not given.

(1)

7. What signs would indicate that a mare is in season?

(3 x ½)

8. List three methods that can be used to diagnose pregnancy in the mare.

(3 x ½)

9. What is the difference between *Sarcoptes spp.* and *Psoroptes spp.* mites? (2 x $\frac{1}{2}$) **10.** Describe the signs of flea infestation in a dog.

Explain how knowledge of the life-cycle of a flea aids in controlling an infestation.

(1)

11. Define the following terms:

Questions 12 - 15 relate to the Animals (Scientific Procedures) Act 1986

12. List **three** pieces of information that must be entered on the cage label of a protected animal undergoing regulated procedures.

(3)

13. Complete the following table to indicate who is responsible:

for ensuring the NACWO discharges his/her duties effectively;	
for supplying and directing the use of controlled drugs for use in protected animals;	
for ensuring all licencees are aware of and comply with severity conditions of project licences;	
for advising the Home Secretary on applications for personal and project licences;	
for ensuring that every protected animal is seen and checked by a competent person at least once a day;	
for animals that have had regulated procedures carried out on them;	
for labelling the cages and pens used for holding experimental animals;	
for being familiar with project licences in use, including severity limits and conditions, adverse effects and humane end points;	
for ensuring full and accurate records are kept of procedures carried out on protected animals;	
for ensuring personal licencees have authority to carry out regulated procedures as part of a project;	
for making a report to the Home Secretary on its activities each year so it can be laid before Parliament;	
for considering project licence applications involving substantial severity in primates;	
for ensuring the establishment is appropriately staffed at all times;	
for providing the Inspector with reasonable access to the premises;	
for maintaining suitable records of environmental conditions in rooms where animals are held;	
to Parliament for the operation of the Act.	

(16 x ½)

14. List **three** examples of non-technical procedures that can be delegated to a non-licensed person by a personal licensee when they are within reach but not in the room.

	 (3)
Under what circumstances is it permissible for such delegation to occ	ur?
	(1)
15. Dr X is studying blood pressure in conscious dogs. The dogs are required to be fitted with telemetry devices and carotid loops. These procedures require separate surgical operations under general anaesthesia. At the end of the study the dogs will be killed and samples taken from heart and major blood vessels	ired 3 the
Dr Y works at the same Institution and also uses dogs in his study of nervous control of muscle contraction. He works on terminally anaesthetised dogs.	
Does the repeated anaesthesia in Dr X's project constitute a re-use of animals?	:
	(1)
Would Dr Y be permitted to use Dr X's dogs?	
Explain the reasons for your answers.	(1)
	 (3)

16. Explain the following terms:

coefficient of inbreeding	
	(2)
hybrid vigour	
	(2)
congenic	
	 (2)

17. You have five fish tanks, each measuring 90cm x 20cm x 20cm. Each tank has a mass of 12kg when empty. What is their total mass when full of water? (Show your workings).

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18. You are asked to transfer six 25g mice from one isolator to another using a sealed plastic container.

From the information provided calculate how much time you would have to carry out this procedure before the relative humidity (RH) of the air inside the container reached 100%. Assume air temperature remains constant. (Show your workings).

- Container dimensions: 25cm x 20cm x 12cm.
- Container air is at 21°C and 45% RH.
- An average 25g mouse breathes out 1 litre of air per hour, adding 30mg water vapour to it in the process.
- 1 litre of air at 21°C & 45% RH contains 8.7 mg water.
- 1 litre of air at 21°C & 100% RH contains 18.7mg water.

Please turn over

Part II

Long Answer Questions

Attempt **TWO** of the four questions

Write your answers on the paper provided

Start each new answer on a fresh sheet of paper Write on one side of the paper only

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

You are advised to spend half an hour on each question

The approximate percentage of marks available for each section of the questions is indicated

Credit will be given for suitable illustration

You must hand in all answer sheets at the end of the examination

Attempt TWO questions

1.	Discuss the factors affecting the level of ammonia in animal cages.	85%
	State the reasons for minimising the level.	15%
2.	Explain how knowledge of animal behaviour is important to animal care.	100%
3.	Describe the signs of pain that may be exhibited by rats.	30%
	Explain how a system using such signs could define a humane endpoint following an experimental procedure on a rat.	70%
4.	Discuss the factors that may affect the route selected to administer a test substance to an animal.	100%

End of Part II

Please turn over

Part III

Long Answer Questions

Attempt ONE of the two questions

Write your answers on the paper provided

Start each new answer on a fresh sheet of paper Write on one side of the paper only

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

You are advised to spend one and a half an hours on this part of the examination

The approximate percentage of marks available for each section of the question is indicated

Credit will be given for suitable illustration

You must hand in all answer sheets at the end of the examination

Attempt ONE question only

5.	Define the term 'air conditioning'.	5%
	Define its purpose in relation to laboratory animal housing.	10%
	Discuss how the air conditioning system in a barrier maintained laboratory animal building impinges upon building design.	85%

6. Discuss the production and maintenance of inbred mouse strains.

100%