

Candidate Number:

The Institute of Animal Technology



MEMBERSHIP EXAMINATION 2000

Section A - ANIMAL TECHNOLOGY

Morning, 6th June

(TOTAL TIME: 3 HOURS)

Part I

Short Answer Questions

(One third of the total marks)

Part II

Long Answer Questions

(Two thirds of the total marks)

Write your candidate number at the top of this cover

Read the instructions for each part carefully

Part I

Attempt ALL Questions

You are advised to spend one hour on this part

Write your answers in the spaces provided

Numbers in brackets indicate the marks available for each question

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

Attempt ALL parts

1. Complete the table below:

Species	Gestation Period	Duration of Oestrus	Length of Oestrous Cycle	Age at first Mating	Weaning Age
Mouse					
Ferret					
Rabbit					
Sheep					
Dog					

(25 x ½)

2. Define the following terms:

- (a) heifer..... (1)
- (b) calf..... (1)
- (c) bull..... (1)
- (d) mare..... (1)
- (e) stallion..... (1)
- (f) gelding..... (1)
- (g) filly..... (1)
- (h) colt..... (1)

3. List **three** advantages of the artificial insemination of cattle.

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(3)

4. State **four** ways in which the nutritional quality of a pelleted diet may be affected after delivery to the animal facility.

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(4)

5. State **one** advantage and **one** disadvantage of adding antibiotics routinely to animal diets.

advantage.....

(1)

disadvantage.....

(1)

6. State **two** ways in which the problem of obesity in long term rodent studies may be addressed.

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(2)

7. Give one sign exhibited by laboratory animals for each of the following dietary deficiencies.

- (a) vitamin E..... (1)
- (b) vitamin C..... (1)
- (c) protein..... (1)

8. State **two** ways in which an ultra high-efficiency filter achieves sterilisation of air.

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

9. What purpose is served by fitting a roughing filter prior to an ultra high-efficiency filter?

..... (1)

10. Why is there a difference in air pressure across a filter?

..... (1)

11. Give **two** reasons for fitting high-efficiency filters to the air extract system of an SPF building.

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

12. Define the term 'sterilisation'.

.....
(2)

13. Recommend a method, different in each case, to ensure sterility of each of the following objects on entry to an SPF building:

- (a) stainless steel cage..... (1)
- (b) ballpoint pens..... (1)
- (c) pre-irradiated vacuum packed diet..... (1)

14. Briefly explain why the temperature achieved in an autoclave is usually greater than 100°C.

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(3)

15. For what purpose may a low temperature formaldehyde cycle on an autoclave be used?

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(1)

16. State **three** methods that may be used to monitor the performance of an autoclave and give one advantage and one disadvantage for each.

Method	Advantage	Disadvantage

(9 x ½)

17. Define the following terms:

(a) barrier maintained

..... (2)

(b) hysterectomy derived

..... (2)

(c) gnotobiotic

..... (2)

(d) conventional

..... (2)

18. List **six** samples which may be sent from an SPF unit for routine microbiological examination.

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(6 x ½)

19. Give **three** main features of a transport container which will maintain the SPF status of small rodents.

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(3 x ½)

20. Define the term 'disinfection'.

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(1)

21. List **eight** factors which may affect the efficiency of disinfectants.

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(8 x ½)

22. List **four** groups of disinfectants used in the animal unit.

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(4 x ½)

26. a) Define the term 'zoonotic disease'.

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(2)

b) Name a zoonotic disease of:

Dogs (½)

Non-human primates (½)

Cattle (½)

27. Which type of air pressure regime would be used in an experimental isolation unit housing mice infected with a contagious disease?

.....
(1)

Questions 28-36 relate to the Animals (Scientific Procedures) Act 1986

28. State the ' 3 Rs ' and explain each term.

R
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(2)

R
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(2)

R
.....
(2)

29. To which type of procedure is an 'unclassified' severity limit applied?

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(1)

30. Name **three** procedures which may be applied to protected animals, which are not regulated.

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(3)

31. The Act permits the conduct of a regulated procedure only when **three** specific requirements have been met. What are they?

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(3)

32. Personal licensees are responsible for ensuring that cages or pens are clearly labelled. In addition to the identity of the animal or cage itself, name the **three** things that cage labels must identify.

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(3)

33. State **three** purposes for which the Home Office Inspector visits a designated establishment where regulated procedures are being performed.

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(3)

34. Identify the individual accountable under the Act for each of the following:

Responsibility	Individual
Ensuring that health records of the protected animals at a designated establishment are maintained	
The welfare of animals which have undergone regulated procedures	
Ensuring that appropriate supervision is provided for a new personal licensee	
Ensuring an adequate depth of anaesthesia during a surgical procedure	

(4 x ½)

35. How is authority given for re-use of animals?

.....
(½)

36. Complete the following table as indicated by (*) of euthanasia methods listed in Schedule 1:

Method	Animal for which appropriate	Weight of animal
Overdose of anaesthetic	*	No limit
Exposure to carbon dioxide gas	Rodents, rabbits and birds	*
Dislocation of the neck	Rodents	*
	*	Up to 1 kg
	Birds	*
Concussion of the brain	*	Up to 1 kg
	Rabbits	*
	*	Up to 250g
	Amphibians and reptiles (with destruction of the brain)	*
Decapitation of foetal, larval and embryonic forms	*	Up to 50g

(10 x ½)

37. What is the purpose of Good Laboratory Practice (GLP) regulations?

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

38. For each of the following species give a site commonly used for the withdrawal of blood.

Animal	Site
Rabbit	
Dog	
Chicken	
Rat	

(4 x ½)

39. State **six** factors which can cause variation in the accuracy and consistency of body temperature measurements.

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(6 x ½)

40. List **six** precautions you would take when withdrawing a sample of blood from a rabbit to avoid contamination of the sample.

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(6 x ½)

41. Describe **four** signs which may indicate crisis in an animal during recovery from anaesthesia.

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(4 x ½)

42. State **two** reasons for giving fluids to animals post-operatively.

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(2 x ½)

43. Give **two** reasons for providing animals with an acclimatisation period prior to a surgical procedure.

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(2 x ½)

44. List **four** desirable physical features of an animal to be presented for an experimental surgical procedure.

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(4 x ½)

45. Give **five** criteria for the selection of eggs suitable for incubation.

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(5 x ½)

46. List **three** functions of a broody hen during natural incubation.

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(3)

47. Give **one** method for the individual identification of the following.

- (a) one week old chicks (½)
- (b) adult chickens (½)

48. List **six** problems which may occur during the incubation of hens eggs.

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(6 x ½)

End of Part I

Part II

Attempt FOUR Questions

This part should take approximately two hours to complete

Equal marks are available for each question

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

Start each new 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 every answer sheet***

Credit will be given for diagrams which make your answer clearer

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

Please turn over →

Attempt FOUR questions

1. Under the following headings explain how the health and well-being of laboratory primates may be affected by:
- (a) *ad libitum* feeding of pelleted diet **25%**
 - (b) sterilisation of foodstuffs **10%**
 - (c) feeding of fresh fruit and vegetables **25%**
 - (d) addition of antioxidants to diets **20%**
 - (e) forage feeding in gang cages **20%**
2. You are required to fumigate a Specified Pathogen Free (SPF) Unit with formaldehyde prior to restocking with clean animals.
- Under the following headings describe the method to be used.
- (a) preparation of the unit and contents **10%**
 - (b) ventilation system **10%**
 - (c) method **55%**
 - (d) safety precautions to be taken **25%**
3. (a) List **five** different types of organism that can cause infectious disease in animals and give an example of each. **20%**
- (b) You suspect that a group of mice in one room of a large barriered rodent facility are showing clinical signs of an infectious disease. Describe the actions that should be taken to limit the spread of infection. **80%**

4. With reference to the Animals (Scientific Procedures) Act 1986, discuss the role of the Named Animal Care and Welfare Officer (NACWO). 100%
5. (a) Define the term 'euthanasia'. 10%
- (b) List **four** qualities required of personnel carrying out Schedule 1 methods of killing. 10%
- (c) Describe the culling of a group of adult mice by:
- i) cervical dislocation 25%
 - ii) overdose of an anaesthetic by intraperitoneal injection 30%
- (d) Discuss the factors which influence your choice of these two methods. 25%
6. Under the following headings discuss the factors to consider when administering substances to laboratory animals:
- (a) the animal 25%
 - (b) substance to be administered 25%
 - (c) route of administration 35%
 - (d) legality 15%

End of Part II