HM Government

T-LEVELS

T Level Technical Qualification in Animal Care and Management (Level 3)

Science Knowledge Test (8717 - 411)

If provided, stick your candidate barcode label here.

Date of exam: TBC
Duration: 2 hours

Candidate name (first, last)

First

Last

Candidate enrolment number

Date of birth (DDMMYYYY)

Gender (M/F)

Assessment date (DDMMYYYY)

Centre number

Candidate signature/declaration*

- If additional answer sheets are used, enter the additional number of pages in this box. ➡
- Before taking the examination, **all candidates** must check that their barcode label is in the appropriate box. Incorrectly placed barcodes may cause delays in the marking process.
- Please ensure that you staple additional answer sheets to the back of this answer booklet, clearly labelling these with your full name, enrolment number, centre number and qualification number in BLOCK CAPITALS.
- All candidates need to use a **black/blue** pen. **Do not** use a pencil or gel pen, unless otherwise instructed.
- If provided with source documents, these documents **will not** be returned to City & Guilds and will be shredded. Do not write on the source documents.
- *** I declare that I had no prior knowledge of the questions in this examination and that I will not divulge to any person any information about the questions.**

You should have the following for this examination

- a pen with blue or black ink
- a calculator

General instructions

- The marks for questions are shown in brackets.
- This examination contains **18** questions. Answer all questions.
- Answer the questions in the spaces provided. Answers written in margins or on blank pages will not be marked.
- Cross through any work you do not want to be marked.
- Show all your workings.

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This exam has been split into **three** sections.

Below details the types of questions and marks available for each section. Please allow time for each section accordingly.

Section A is made up of **36** marks and includes **8** short answer and medium answer questions.

Section B is made up of **24** marks and includes **7** short answer and medium answer questions.

Section C is made up of **20** marks and includes **2** short answer and medium answer questions and **1** extended response question.

Version and date	Change detail	Section
1.1 Dec 2025	Amendment to Q17 following BMR calculation specification update	Section C: Q17

Section A

1 a) Identify **two** characteristics of mammals. (2 marks)

b) Give **one** example of a characteristic that is an exception in some mammals and give **one** example of a species with this characteristic. (2 marks)

2 State **three** causes of induced mutations. (3 marks)

3 Identify **two** processes which take place during the metaphase stage of mitosis. (2 marks)

4 Identify **one** of the enzymes involved in transcription and explain its role within the process of DNA replication.

(3 marks)

5 Explain **three** differences between the structure of animal DNA and RNA. (6 marks)

6 The dominant creeper gene produces abnormally short legs in chickens. The recessive allele is a lethal gene.

Explain **two** implications to the F1 generation in terms of the lethal gene, if two heterozygous parent chickens were mated. (4 marks)

7 In mice, long tails (T) are dominant to short tails (t) and black hair (B) is dominant to white hair (b). These traits are independent of each other.

A male mouse of genotype Ttbb is crossed with a female mouse of genotype ttBb.

Using the information provided, identify the gametes using the FOIL method and complete the Punnett square, giving the predicted genotypic and phenotypic ratios from the cross. (8 marks)

8 The Volcanoes National Park in Rwanda is home to a small population of approximately 350 Mountain Gorillas. Their population is being threatened by the increasing number of tourists and from illegal hunting and poaching from neighbouring countries, Burundi and Congo. The impact of which is shown in the table below.

	2018	2019	2020	2021	2022
Number of African tourists	130,000	180,000	80,000	50,000	200,000
Number of tourists from other continents	1,500,000	1,800,000	500,000	0	2,000,000
Number of Gorilla deaths due to zoonotic disease	24	32	56	9	22
Number of Gorillas hunted/poached	7	9	12	8	5

Describe the mitigations that the Volcanoes National Park could take to help prevent extinction of the Mountain Gorilla.

(6 marks)

Section B

9 State **three** chemical factors that affect rates of reaction. (3 marks)

10 Identify the type of bond that will be formed between group 1 and group 7 of the periodic table. (1 mark)

11 Explain **two** effects denaturation has on enzyme activity. (4 marks)

12 Explain **one** effect of **each** of the following on the establishment of chemical equilibrium.

a) Temperature. (2 marks)

b) Catalysts. (2 marks)

13 Summarise **three** of the steps that occur during the chemical reaction of glycolysis. (6 marks)

14 One of the gases used in a laboratory for Bunsen burners is Propane (C_3H_8). When burnt with Oxygen (O_2) it produces Carbon Dioxide (CO_2) and Water (H_2O).

Use these chemical formulae to work out the balanced equation for the combustion of Propane. (2 marks)

15 A vet has recommended that the abrasions on a rabbit's foot are rinsed in a 2M salt water solution to assist healing. Instructions are given to the veterinary nurse to make up the solution.

Using the periodic table in Appendix 1, calculate the amount of sodium chloride (NaCl) that the veterinary nurse would need to add to 1 litre of water to make a 2M solution to 1.d.p.
Show your workings. (4 marks)

Section C

16 Identify and describe **two** techniques of medicine administration.

(4 marks)

17 An adult Labrador weighs 27kg. Using the correct formulae below calculate

RER (over 5kg) = (30 x bodyweight in kg) + 70kcal
BMR $\approx$ 70 x $M^{0.75}$ where M is the mass in kg

a) the resting energy requirements of the Labrador. Show your workings. (2 marks)

b) the basal metabolic rate of the Labrador. Show your workings. (2 marks)

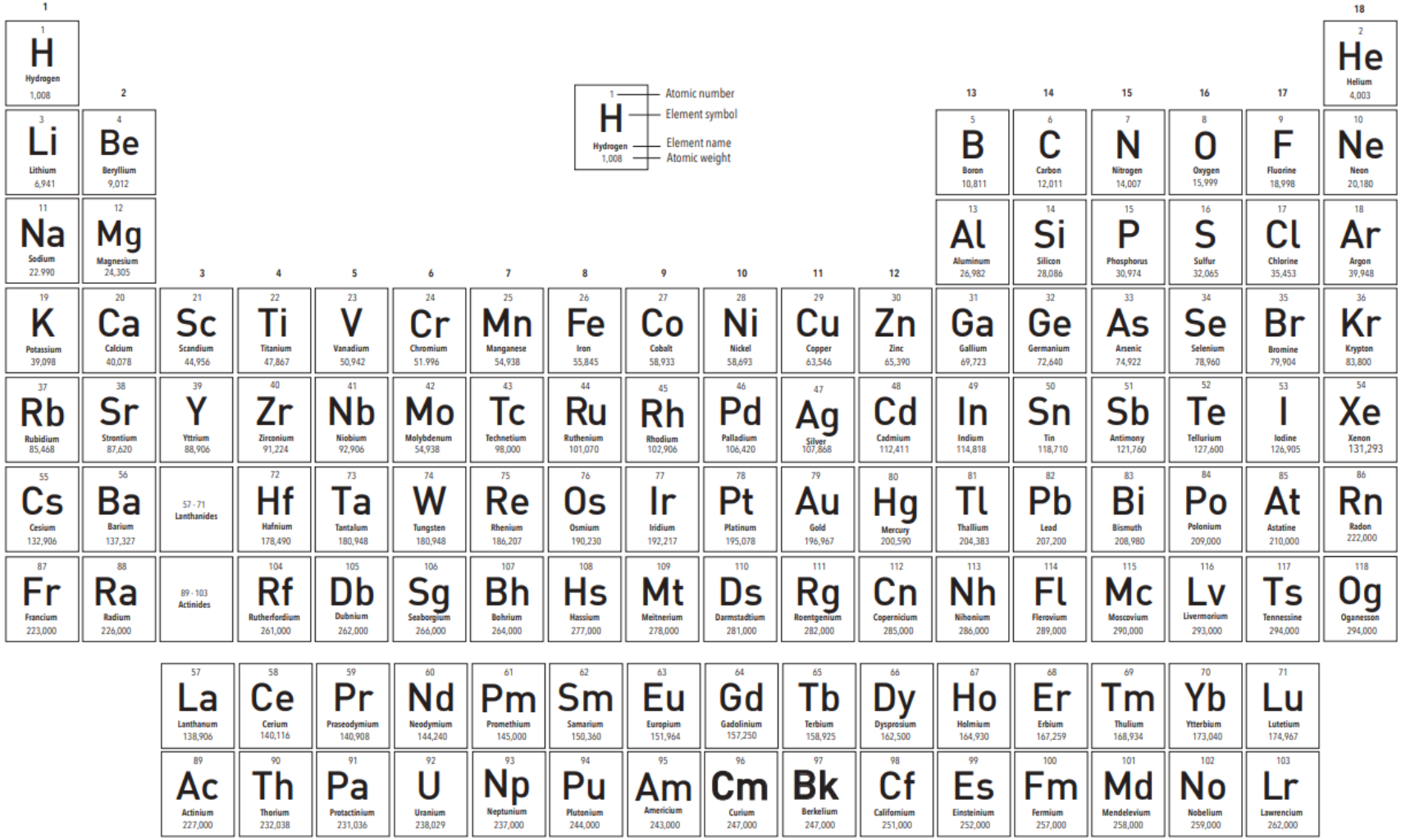
18 A kitten presenting with signs associated with cat flu has been brought into the veterinary practice and is sitting in a mixed waiting room. They are called into a cat only consultation room and the diagnosis of cat flu is confirmed. The kitten is admitted, and hospitalised in the isolation wards and treatment of intravenous fluids, anti-inflammatories and antibiotics is commenced. After five days of treatment, the kitten is discharged back to its owner.

Discuss the role of the veterinary team in the diagnosis of the disease, management and treatment of the kitten when hospitalised and then returned to its owner.

Evaluate the journey of the kitten through the veterinary practice and any impact this may have on the kitten's welfare. (12 marks)

End of Assessment

PERIODIC TABLE OF THE ELEMENTS



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