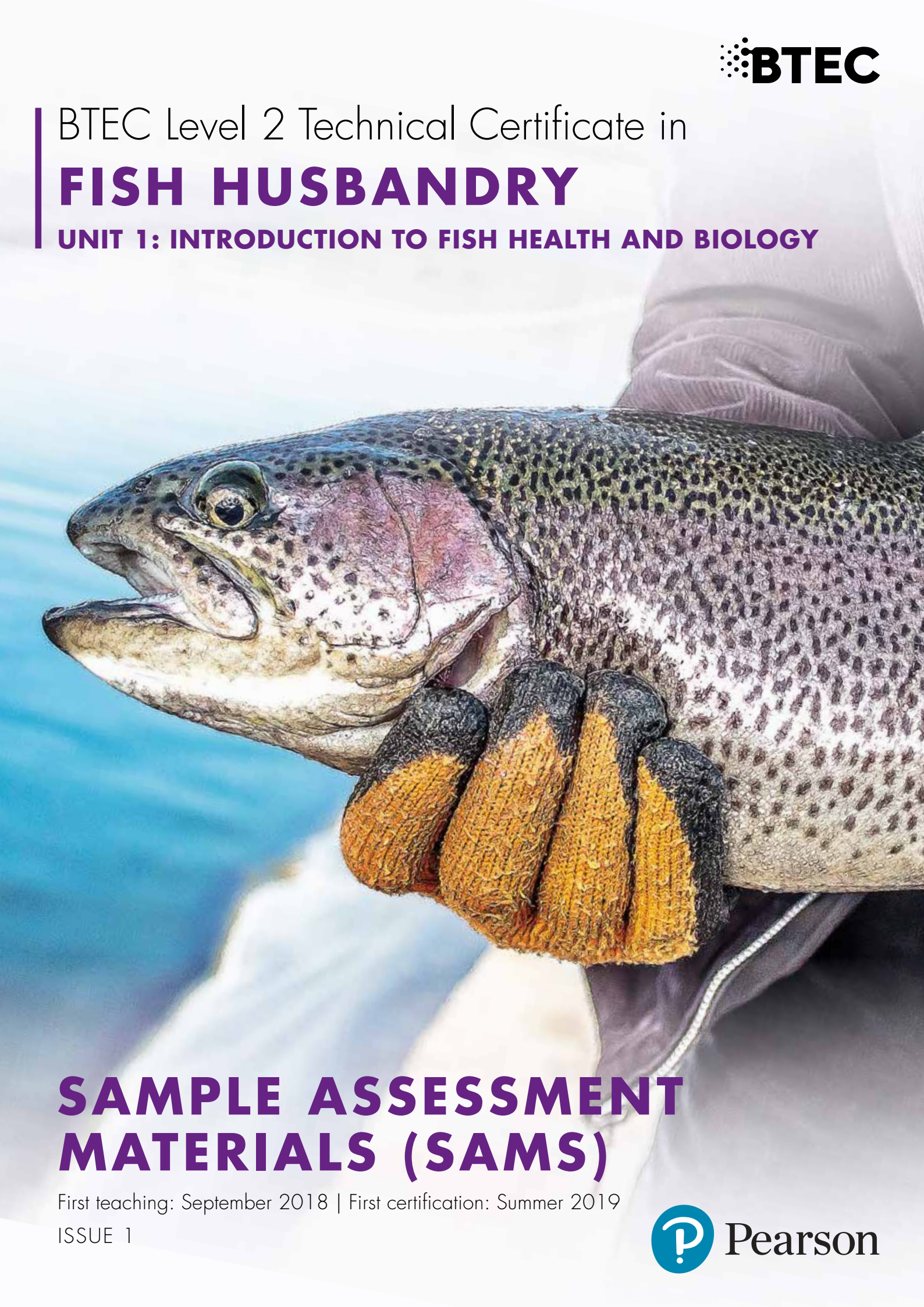
BTEC

BTEC Level 2 Technical Certificate in

FISH HUSBANDRY

UNIT 1: INTRODUCTION TO FISH HEALTH AND BIOLOGY



SAMPLE ASSESSMENT MATERIALS (SAMS)

First teaching: September 2018 | First certification: Summer 2019

ISSUE 1

Pearson

Edexcel, BTEC and LCCI qualifications

Edexcel, BTEC and LCCI qualifications are awarded by Pearson, the UK's largest awarding body offering academic and vocational qualifications that are globally recognised and benchmarked. For further information, please visit our qualifications website at qualifications.pearson.com. Alternatively, you can get in touch with us using the details on our contact us page at qualifications.pearson.com/contactus

About Pearson

Pearson is the world's leading learning company, with 35,000 employees in more than 70 countries working to help people of all ages to make measurable progress in their lives through learning. We put the learner at the centre of everything we do, because wherever learning flourishes, so do people. Find out more about how we can help you and your learners at qualifications.pearson.com

References to third-party material made in this specification are made in good faith. We do not endorse, approve or accept responsibility for the content of materials, which may be subject to change, or any opinions expressed therein. (Material may include textbooks, journals, magazines and other publications and websites.)

ISBN 978 1 446 94797 5

Contents

Write your name here

Surname	Other names

Pearson BTEC Technical Certificate

Centre Number

Learner Registration Number

Fish Husbandry

Unit 1: Introduction to Fish Health and Biology

Sample Assessment Material
Time: 1 hour 15 minutes

Paper Reference
XXXXXX

You may need a calculator and a ruler.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and learner registration number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*

Information

- The total mark for this paper is 60.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

S58475A

1/1/1/1/1

S 5 8 4 7 5 A 0 1 1 7

Pearson

SECTION A

Answer ALL questions in this section. Write your answers in the spaces provided.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

1 **Figure 1** shows a fish.

Figure 1

Identify the type of fish shown in Figure 1.

Select **one** option.

(1)

☒ **A** Bass

☒ **B** Carp

☒ **C** Perch

☒ **D** Rudd

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

2 **Figure 2** shows the chambers of a fish heart.

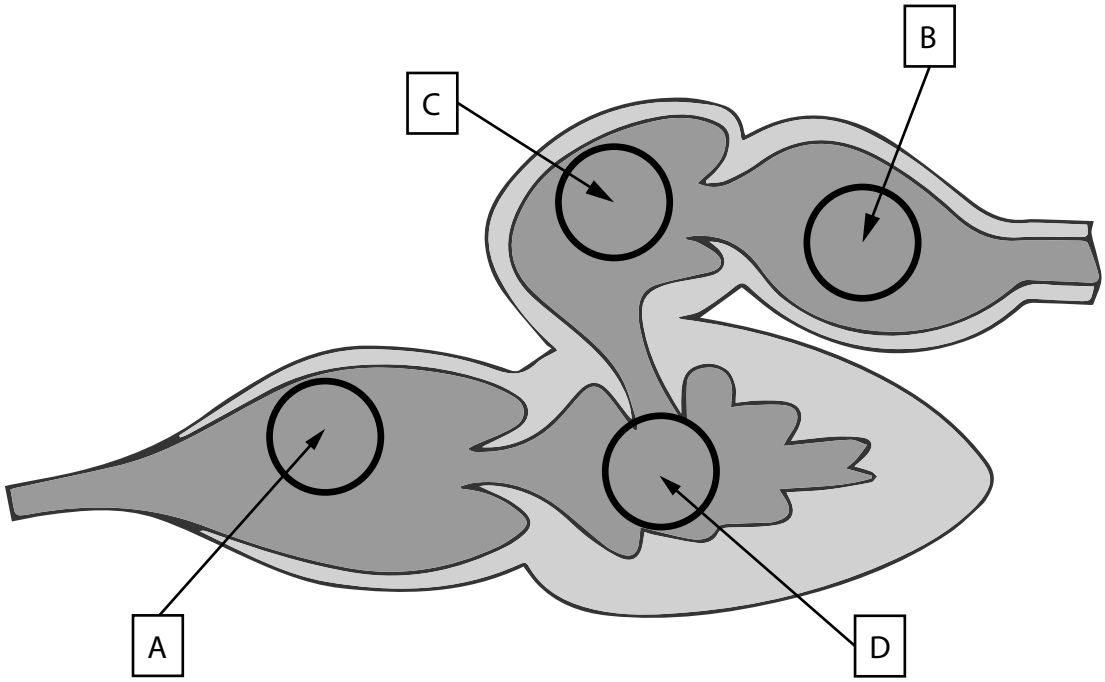


Figure 2

Identify the atrium.

Select the part of Figure 2 that shows the atrium.

Select **one** option.

(1)

- ☒ **A**
- ☒ **B**
- ☒ **C**
- ☒ **D**

3 Give a suitable water temperature in degrees Celsius (°C) for the growth of rainbow trout.

(1)

.....

.....

4 How long is the Atlantic salmon farming production cycle?

Select **one** option.

(1)

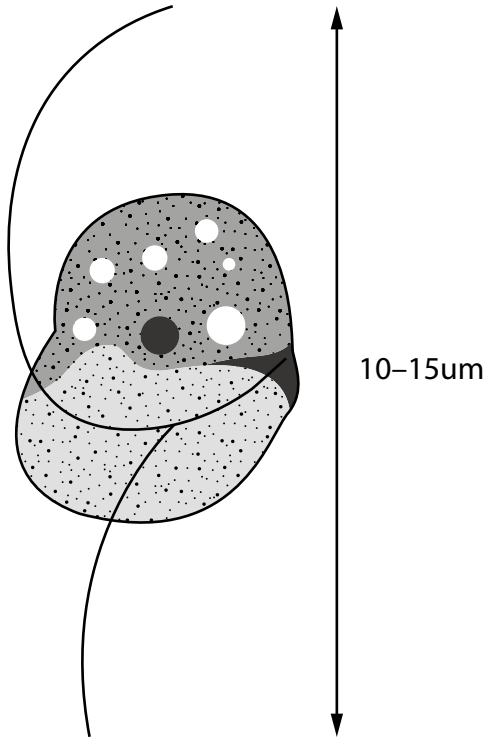
☒ **A** 1 year

☒ **B** 3 years

☒ **C** 5 years

☒ **D** 7 years

5 **Figure 3** shows a fish parasite.



1mm - $1e^{-4}$cm - 0.0001cm

Figure 3

Identify the parasite shown in Figure 3.

Select **one** option.

(1)

☒ **A** Argulus

☒ **B** Costia

☒ **C** Diplostomum

☒ **D** Ergasilisi

6 Which of these are signs of bacterial kidney disease (BKD)?

Select **two** options.

(2)

- ☒ **A** Damaged fins
- ☒ **B** Lively movements
- ☒ **C** Protruding eyeballs
- ☒ **D** Raised scales
- ☒ **E** Swollen stomach

7 Which of these is part of the male reproductive system of a fish?

Select **one** option.

(1)

- ☒ **A** Deferent duct
- ☒ **B** Innervated cilia
- ☒ **C** Neural arch
- ☒ **D** Pyloric caecum

8 Which organ removes ammonia from the body of a fish?

Select **one** option.

(1)

- ☒ **A** Liver
- ☒ **B** Kidney
- ☒ **C** Pancreas
- ☒ **D** Thymus

9 Match each fish type to a characteristic of that fish type.

Draw **one** line from each fish type to **one** characteristic.

(2)

Fish type	**Characteristic**
	Found in fast flowing waters
Dace	Lives at sea
	Over 30 cm at maturity
Bream	Solitary
	Distinctive upturned bottom jaw

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

10 **Figure 4** shows the skeleton of a trout.

Label Figure 4 with the names of bones **A** and **B**.

Use the names in the box below. Each name may be used once, or not at all.

(2)

Dorsal rib	Adipose fin	Neural spine
Vetebral column	Pectoral girdle	

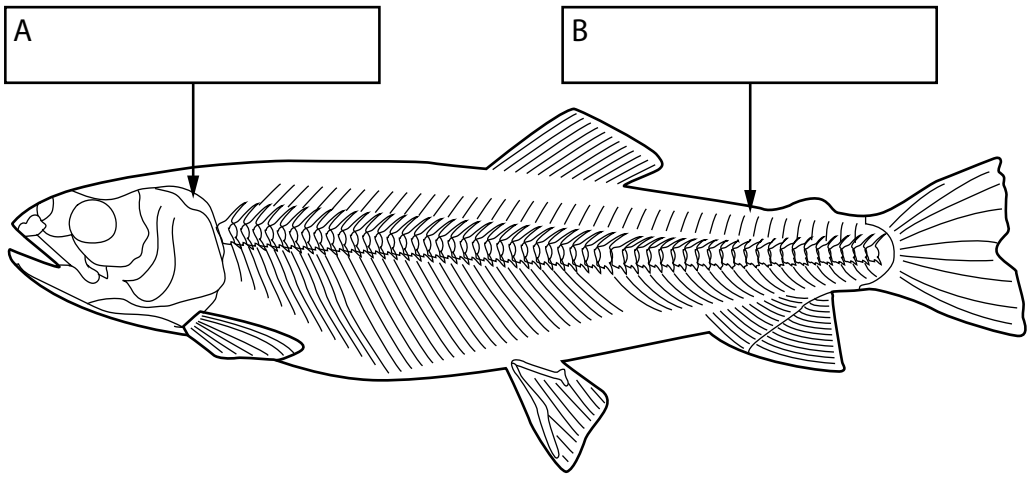


Figure 4

11 Give **one** behavioural sign of an external parasite infestation on a fish.

(1)

.....

.....

12 The European Eel spends some of its life in the sea and some in fresh water.

Which stages of the life cycle of the European Eel take place **only** in fresh water?

Select **two** options.

(2)

- ☒ **A** Yellow Eel
- ☒ **B** Glass Eel
- ☒ **C** Elvers
- ☒ **D** Silver Eel
- ☒ **E** Leptocephalus

13 **Figure 5** shows a salmon.

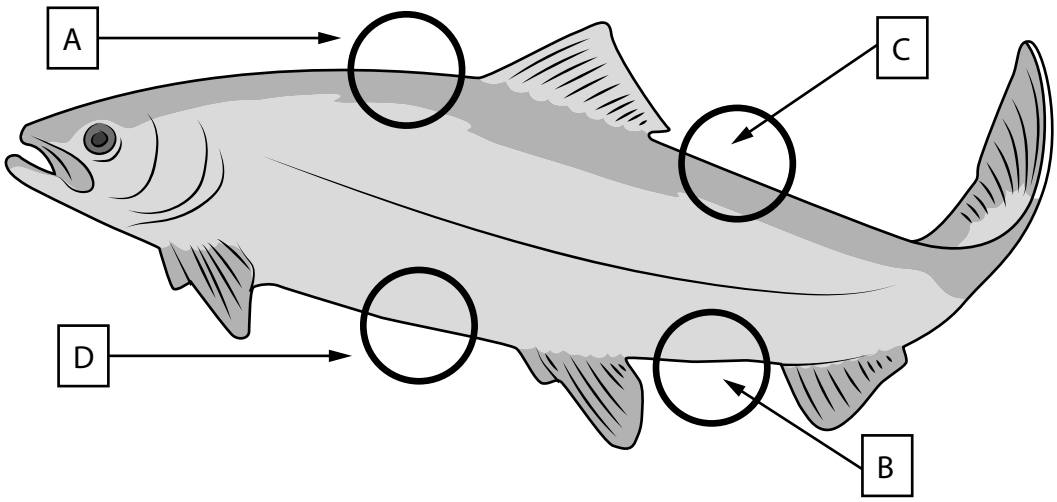


Figure 5

Which location is suitable for injecting a vaccination into the abdominal cavity?

Select the part of Figure 5 that shows the suitable location.

Select **one** option.

(1)

- ☒ **A**
- ☒ **B**
- ☒ **C**
- ☒ **D**

14 What colour should the gills be in a healthy flounder?

Select **one** option.

(1)

- ☒ **A** Light blue
- ☒ **B** Light grey
- ☒ **C** Light red
- ☒ **D** Light yellow

15 Describe how a test strip is used to test levels of chemicals in water.

(3)

16 Which **two** stimuli are detected by the lateral line?

Select **two** options.

(2)

- ☒ **A** Chemicals
- ☒ **B** Heat
- ☒ **C** Light
- ☒ **D** Pressure
- ☒ **E** Vibrations

17 What is the average life span of a roach?

Select **one** option.

(1)

- ☒ **A** 1–4 years
- ☒ **B** 8–11 years
- ☒ **C** 15–18 years
- ☒ **D** 22–25 years

18 Describe how overfeeding can lead to poor water quality.

(3)

19 Explain **one** way the gills help to regulate water in freshwater fish.

(3)

TOTAL FOR SECTION A = 30 MARKS

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

SECTION B

Answer ALL questions.

Use this scenario to answer Questions 20–22.

Scenario 1

Stuart has set up a Koi carp farm and wants to produce the Sanke colouration.

He is basing his production system timing on the growth chart shown and will carry out his first fry selection at 4 weeks.

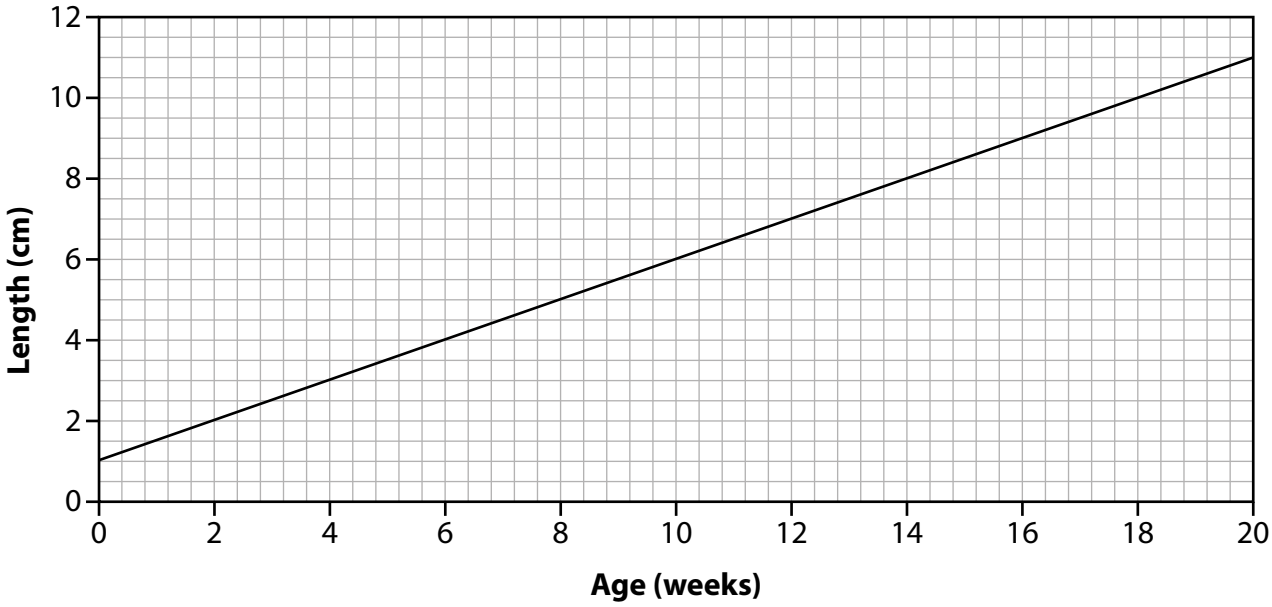


Figure 6

20 Use the growth chart to calculate the expected growth rate of the Koi carp in **cm/week**.

You must show your working.

(2)

..... **cm/week.**

21 Explain **two** limitations of the growth chart Stuart is using for monitoring the growth of his carp.

(4)

1 .....

.....

.....

.....

2 .....

.....

.....

.....

22 Explain **two** reasons why Stuart needs to carry out fry selection.

(4)

1 .....

.....

.....

.....

2 .....

.....

.....

.....

TOTAL FOR SCENARIO 1 = 10 MARKS

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

BLANK PAGE

Answer ALL questions.

Use this scenario to answer Questions 23–25.

Scenario 2

A game fishery has ordered 450 fully grown rainbow trout from a trout farm. The journey to the game fishery will take two hours. The transport vehicle has two tanks equipped with aerators and dissolved oxygen monitors.

The water in the farm pond has been tested before stocking the tanks on the transport vehicle. Some of the results are shown in the table.

Nitrate (ppm)	Nitrite (ppm)	Ammonia (ppm)	Water hardness (mg/l)
5	0	1	200

Figure 7

23 Explain the purpose of the equipment on board the transport vehicle.

(2)

.....

.....

.....

.....

24 Explain **two** actions that should be taken based on the test results from the pond water.

(4)

1 .....

.....

.....

.....

2 .....

.....

.....

.....

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

25 The trout farmer is planning the journey to the game fishery.

Explain **two** ways the trout farmer can promote fish health by considering stocking density for the journey.

(4)

1 .....

.....

.....

.....

2 .....

.....

.....

.....

TOTAL FOR SCENARIO 2 = 10 MARKS

Answer ALL questions.

Use this scenario to answer Questions 26–28.

Scenario 3

Erika works as part of a team of 7 on a farm that produces 1000 tonnes of Atlantic salmon each year. The fish are kept in 5 cages at the sides of a loch, each with fish at different weight ranges. The team spend a day working on each cage, carrying out different activities each day.

Some of the salmon have been affected by lice and a vet has provided treatment for them. Erika has sampled 25 fish and some of the results are shown in the table. She has noticed that some of the salmon have gills that appear grey and blood spots in their eyes.

Number of lice *(Caligula elongatus)*	**0**	**1**	**2**	**3**	**4**
Quality of fish	14	4	5	1	1

Figure 8

26 Calculate the mean (average) number of sea lice per salmon.

You must show your working.

(2)

.....

27 Erika thinks the health of the salmon needs to be reported to the industry body.

Explain **one** factor that leads Erika to think this.

(2)

.....

.....

.....

.....

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

28 Discuss the biosecurity issues Erika must consider when carrying out her role

(6)

TOTAL FOR SCENARIO 3 = 10 MARKS
TOTAL FOR PAPER = 60 MARKS

Unit 1: Introduction to Fish Health and Biology – sample mark scheme

General marking guidance

- All learners must receive the same treatment. Examiners must mark the first learner in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Learners must be rewarded for what they have shown they can do, rather than be penalised for omissions.
- Examiners should mark according to the mark scheme, not according to their perception of where the grade boundaries may lie.
- All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should be prepared to award zero marks if the learner's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a learner's response, the team leader must be consulted.
- Crossed-out work should be marked UNLESS the learner has replaced it with an alternative response.

Specific marking guidance for levels-based mark schemes

Levels-based mark schemes (LBMS) have been designed to assess learners' work holistically. They consist of two parts: indicative content and levels-based descriptors. Indicative content reflects specific content-related points that learners might make. Levels-based descriptors articulate the skills that learners are likely to demonstrate in relation to the Assessment Outcomes being targeted by the question. Different rows within the levels represent the progression of these skills.

When using a levels-based mark scheme, the 'best fit' approach should be used.

- Examiners should first make a holistic judgement on which band most closely matches the learner response and place it within that band. Learners will be placed in the band that best describes their answer.
- The mark awarded within the band will be decided based on the quality of the answer in response to the assessment focus/outcome and will be modified according to how securely all bullet points are displayed at that band.
- Marks will be awarded towards the top or bottom of that band depending on how they have evidenced each of the descriptor bullet points.

Question number	Acceptable answer	Mark
1	C – Perch	**(1)**

Question number	Acceptable answer	Mark
2	C	**(1)**

Question number	Acceptable answer	Mark
3	13 - 15 (°C) Accept any Value between the range	**(1)**

Question number	Acceptable answer	Mark
4	B – 3 Years	**(1)**

Question number	Acceptable answer	Mark
5	B – Costia	**(1)**

Question number	Acceptable answer	Mark
6	C – Protruding eyeballs E – Swollen stomach	**(2)**

Question number	Acceptable answer	Mark
7	A – Deferent duct	**(1)**

Question number	Acceptable answer	Mark
8	B – Kidney	**(1)**

Question number	Acceptable answer	Mark
9	Award 1 mark for each correct answer Dace – Found in fast flowing waters (1) Bream – Over 30 cm at maturity (1)	**(2)**

Question number	Acceptable answer	Mark
10	Award 1 mark for each correct answer A – Pectoral girdle B – Neural spine	**(2)**

Question number	Acceptable answer	Mark
11	Award answers that make reference to the following • Rubbing against the side of the tank/pond/other surfaces (1) • Excessive jumping (1) Accept any reasonable response that relates to both behavioural signs and external parasites, up to a maximum of 1 mark.	**(1)**

Question number	Acceptable answer	Mark
12	A – Yellow Eel(1) C – Elvers (1)	**(2)**

Question number	Acceptable answer	Mark
13	D	**(1)**

Question number	Acceptable answer	Mark
14	C – Light red (1)	**(1)**

Question number	Acceptable answer	Mark
15	Award **one** mark for each descriptive point, up to a maximum of **three** marks for a linked description. • Dip test strip in water (1) then match colour of test strip to defined colour range (1) following given time intervals (1) Accept any other suitable response.	**(3)**

Question number	Acceptable answer	Mark
16	D – Pressure (1) E – Vibrations (1)	**(2)**

Question number	Acceptable answer	Mark
17	B – (8 – 11 years)	**(1)**

Question number	Acceptable answer	Mark
18	Award **one** mark for each descriptive point, up to a maximum of **three** marks for a linked description More food is provided than can be eaten (1) which decomposes (1) increasing levels of ammonia/nitrate/nitrate in the water (1) Accept any other suitable response.	**(3)**

Question number	Acceptable answer	Mark
19	Award **one** mark for identifying the feature and **one** mark for each expansion on how water is regulated up to a maximum of **three** marks. The gills have specialised cells (1) which prevent the loss of salts/actively transport salts in (1) therefore balancing the salt lost in urine (1)	**(3)**

Scenario A

Question number	Acceptable answer	Mark
20	e.g. 10 (cm) / 20 (weeks) (1) = 0.5 (1) Accept answers in the range of 0.45 and 0.55 Award Full marks for correct answers with no workings shown.	**(2)**

Question number	Acceptable answer	Mark
21	Award **one** mark for identifying a limitation and **one** mark for justification of the limitation up to a maximum of **two** marks **each**. • The length/y axis scale only goes up to 12cm (1) whereas Koi can grow up to around 75cm (1) • The age/x axis scale only goes up to 20 weeks (1) whereas Koi can live up to 8 years (1) • The scale of the graph is set in increments of 2 units (1) which may not support monitoring at smaller intervals of time during his production system (1) Accept any other reasonable answer that relates the limitation of the chart to its use in the scenario.	**(4)**

Question number	Acceptable answer	Mark
22	Award **one** mark for identifying the reason and **one** mark for justification of its necessity up to a maximum of **two** marks **each**. • He needs to choose those in best health/condition (1) because they will be more likely to survive/thrive (1) • He needs to choose the Sanke coloration to be grown (1) because many different variations will be present (1) Accept any other suitable response.	**(4)**

Scenario B

Question number	Acceptable answer	Mark
23	Award **one** mark for identifying the purpose of the equipment and **one** mark for justification of its use up to a maximum of **two** marks. Important to monitor changes to Dissolved Oxygen (DO) levels/prevent levels of DO decreasing during the journey (1) because trout need high levels of DO (1) Accept any other suitable response.	**(2)**

Question number	Acceptable answer	Mark
24	Award **one** mark for identifying the action and **one** mark for justifying why it should be taken up to a maximum of **two** marks **each**. • Nitrate and ammonia levels should be monitored (1) because they are present in the water but are within acceptable range (1) • $CaCO_3$ (Calcium Carbonate) could be added to the water (1) because harder water is better for trout health (1) Accept any other suitable response.	**(4)**

Question number	Acceptable answer	Mark
25	Award **one** mark for identifying the effect and **one** mark for justifying the reason for it up to a maximum of **two** marks each. • The farmer may have to take multiple trip (1) as the available tanks may be too small for 450 fully grown rainbow trout (1) • The farmer might not want to stock the tanks at maximum density (1) as the water parameters are more likely to change during the long journey (2 hours) (1) • The farmer will need to make sure tanks are not too empty (1) because this may lead to aggressive behaviour (1) Accept any other suitable response.	**(4)**

Scenario C

Question number	Acceptable answer	Mark
26	(14*0)+(4*1)+(5*2)+(1*3)+(1*4) = 21 (1) 21/25 = 0.84(1) Accept answers which round to 1 Award full marks for correct answers with no workings shown.	**(2)**

Question number	Acceptable answer	Mark
27	Award **one** mark for identifying the factor and **one** mark for justifying why this could be a concern up to a maximum of **two** marks. • Fish are showing signs of a different notifiable disease (1) because sea lice alone do not cause grey gills and blood spots in the eyes (1) • The salmon are also showing symptoms of infectious salmon anaemia (ISA)/sea lice are common vectors for ISA in farmed salmon (1) which must be reported in line with aquatic animal health regulations /ISA is a notifiable disease (1)	**(2)**

Question number	Indicative content
28	Biosecurity Issues to include • Farm should have a biosecurity plan in place • She must comply with the biosecurity plan and be aware that others are also • Transfer of potential diseases because she moves between several sites • Transfer of potential diseases between team members. • Disinfection required of clothing, vehicles, equipment • Use of PPE in handling fish – especially when lice may be transferred, and where there is a suspicion of a notifiable disease • Should monitor fish for signs of ill health/deterioration and report necessary information to manager • Responsibilities when applying treatment if she is involved • Awareness of food production safety

Level	Mark	Descriptor
	0	No rewardable material
1	1-2	• Simple statements that show superficial understanding of the subject matter with inaccuracies. Limited application of understanding to the given situation. • Ideas are considered in isolation and there is little understanding of connections between concepts and issues. • Discussion is superficial.
2	3-4	• Mostly accurate statements that show a sound understanding of the subject matter. Some application of understanding to the given situation. • Ideas are linked together but these may be implied or may not be the most appropriate for the given scenario. • Discussion shows development in some areas.
3	5-6	• Accurate statements that show a comprehensive understanding of the subject matter. Clear and relevant application of understanding to the given situation. • Ideas are linked together in a fluent and logical way showing a thorough understanding of the given scenario. • Discussion is fully developed throughout.

BTEC Level 2 Technical Certificate in
FISH HUSBANDRY

Like what you see?

- Discover the full range of BTEC Level 2 Technicals available.
- Explore free course materials and training events.
- Get your questions answered by our subject experts.

All this and more at: quals.pearson.com/btecL2techDigTech

@TeachBTEC TeachingICT@pearson.com

Aspire. Do. Achieve. Succeed.

ISBN 978-1-4469-4797-5
9 781446 947975