



NCFE Level 1/2 Technical Award in Health and Fitness (603/2650/5)

Unit 01 Introduction to body systems
and principles of training in
health and fitness

Paper number: P000748

Wednesday 13 March 2019 9.00 am–10.30 am

Time allowed: 1 hour 30 minutes

Learner instructions

- Use black or blue ink.
- Answer **all** questions.
- Read each question carefully.
- You **must** write your responses in the spaces provided.
- You may do rough work in this answer book. Cross through any work you do not wish to be marked.
- All of the work you submit **must** be your own.

Learner information

- The marks available for each question are shown in brackets.
- The maximum mark for this paper is 80.
- You may use a calculator.

Please complete the details below clearly and in BLOCK CAPITALS.

Learner name _____

Centre name _____

Learner number

Centre number

Do not turn over until the invigilator tells you to do so.

To be completed by the examiner			
Question	Mark	Question	Mark
1		11(d)	
2		12(a)	
3		12(b)	
4		13(a)	
5		13(b)	
6		14(a)	
7		14(b)(i)	
8		14(b)(ii)	
9		15(a)	
10(a)		15(b)	
10(b)		16(a)	
10(c)		16(b)	
11(a)		17	
11(b)		18	
11(c)		19	
			TOTAL MARK

Section 1

This section has a possible 8 marks.

You should spend about 10 minutes on this section.

Answer **all** questions in the spaces provided.

1 What type of bone is a rib?

[1 mark]

- A** Flat
- B** Irregular
- C** Long
- D** Sesamoid

Answer _____

2 What is the function of a tendon at a joint?

[1 mark]

- A** To attach muscles to bones
- B** To hold bones in place
- C** To protect the ends of bones
- D** To provide lubrication

Answer _____

3 Which **one** of the following muscles is in the lower leg?

[1 mark]

- A** Deltoid
- B** Latissimus dorsi
- C** Rectus abdominis
- D** Soleus

Answer _____

4 What is tidal volume? **[1 mark]**

- A** The amount of air left in the lungs following a maximal exhalation
- B** The amount of air that enters the lungs during normal inspiration at rest
- C** The maximum amount of air you can exhale after taking the deepest inspiration
- D** The maximum amount of air you inhale when doing exercise

Answer _____

5 Veins are one type of blood vessel in the human body.
Which **one** of the following statements is **true**? **[1 mark]**

- A** Veins assist with gaseous exchange
- B** Veins carry blood towards the heart
- C** Veins carry oxygenated blood
- D** Veins have thick, muscular and elastic walls

Answer _____

6 Chloe is 41 years old.
Which **one** of the following would be her predicted maximum heart rate (MHR)? **[1 mark]**

- A** 159
- B** 169
- C** 179
- D** 189

Answer _____

- 7** Which **one** of the following is the calculation for cardiac output (CO)? **[1 mark]**
- A** $CO = SV + HR$
 - B** $CO = SV - HR$
 - C** $CO = SV \times HR$
 - D** $CO = SV \div HR$

Answer _____

- 8** Which **one** of the following heart chambers receives deoxygenated blood from the vena cava? **[1 mark]**
- A** Left atrium
 - B** Left ventricle
 - C** Right atrium
 - D** Right ventricle

Answer _____

Section 2

This section has a possible 51 marks.

You should spend about 50 minutes on this section.

Answer **all** questions in the spaces provided.

9 The human skeleton can be divided into two.

Name **two** bones that are in the appendicular skeleton.

[2 marks]

1 _____

2 _____

10 (a) Define the term 'joint'.

[1 mark]

10 (b) State **three** different types of synovial joints.

[3 marks]

1 _____

2 _____

3 _____

Question 10 continues on the next page.

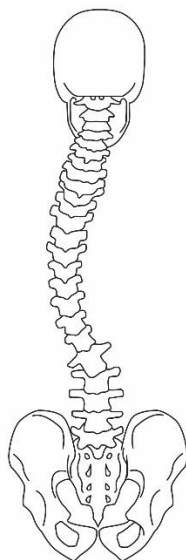
10 (c)**Figure 1**

Figure 1 shows scoliosis of the spine.

Is this statement true **or** false?

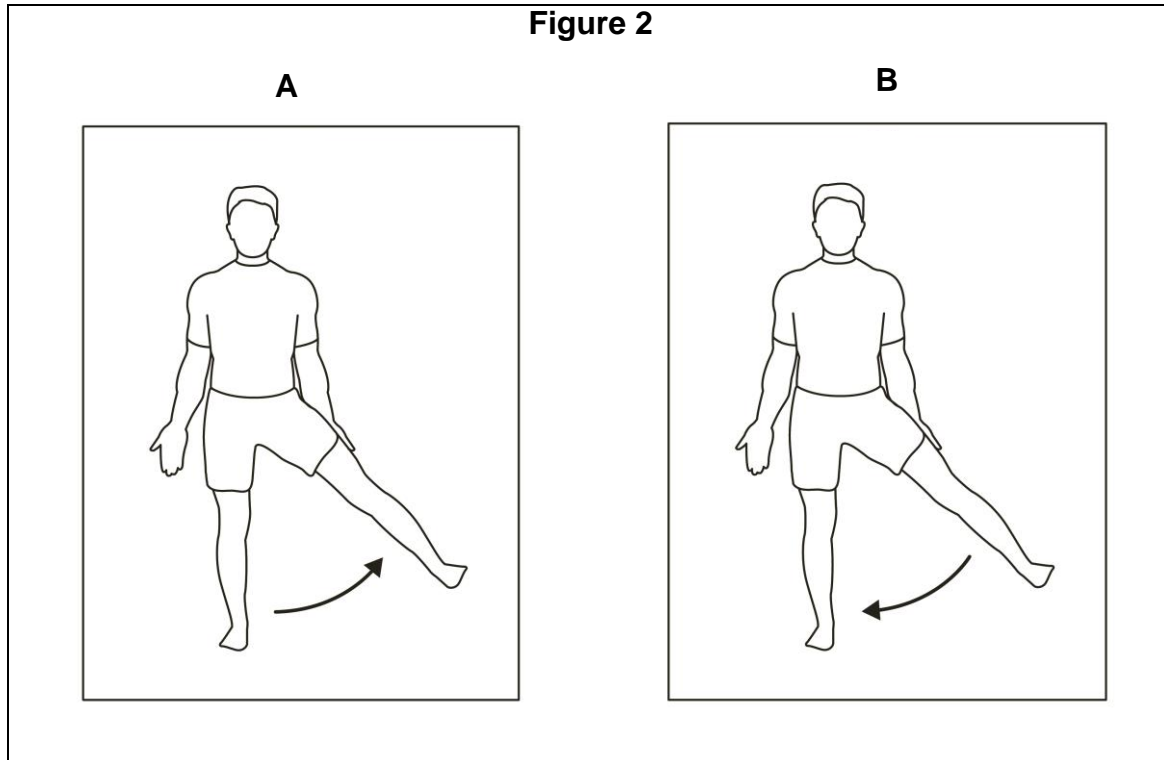
[1 mark]

Answer _____

11 (a) Define the term 'agonist'.

[1 mark]

11 (b) **Figure 2** shows two movements (**A** and **B**) that occur at the hip.



Identify the joint action of the **hip** in movement **A** and movement **B**.

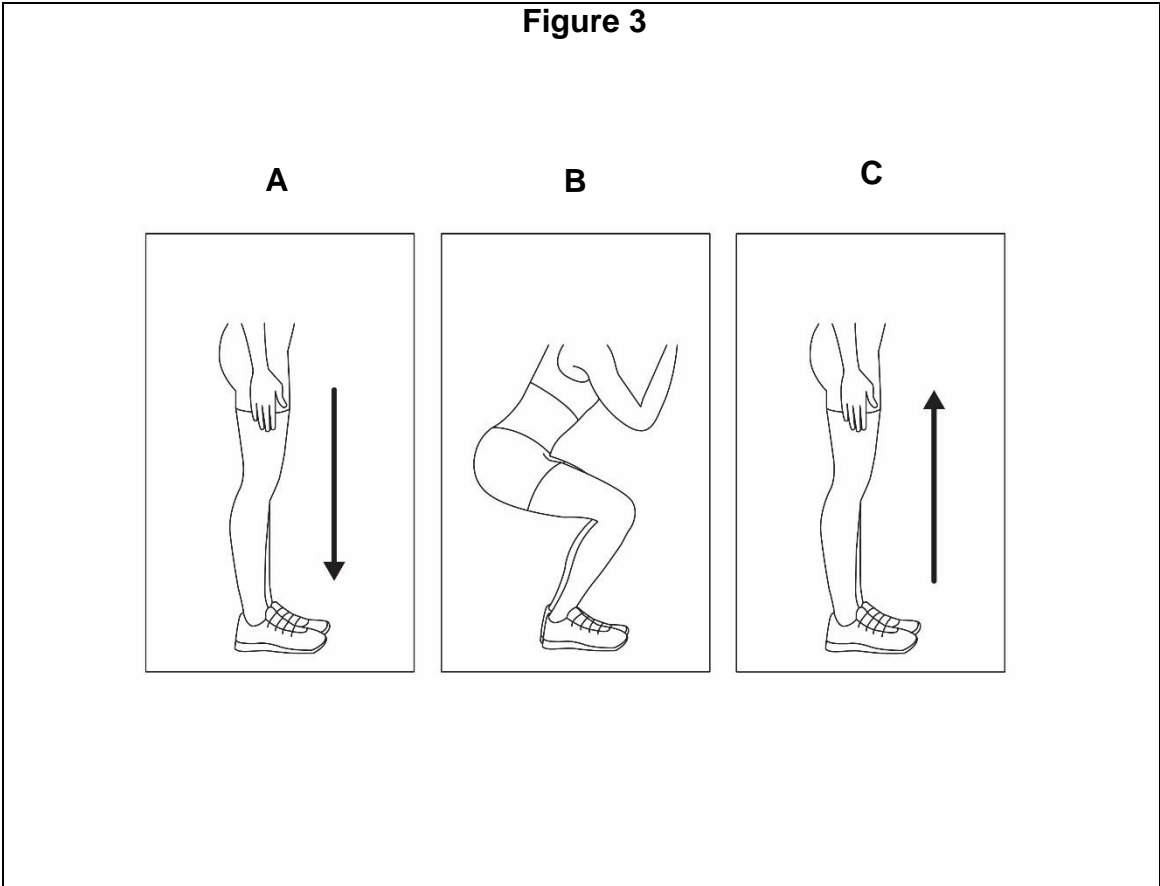
[2 marks]

A _____

B _____

Question 11 continues on the next page.

11 (c) **Figure 3** shows an individual performing a squat.



Use **Figure 3** to complete **Table 1**.

Identify the **antagonist muscle** in the movement at the **knee** from position **A** to position **B** and from position **B** to position **C**.

[2 marks]

Table 1

	A to B	B to C
Antagonist muscle		

- 11 (d) **Figure 4** shows an individual performing a plank.

Figure 4



Identify the type of muscle contraction occurring in **Figure 4**.

Justify your choice.

[2 marks]

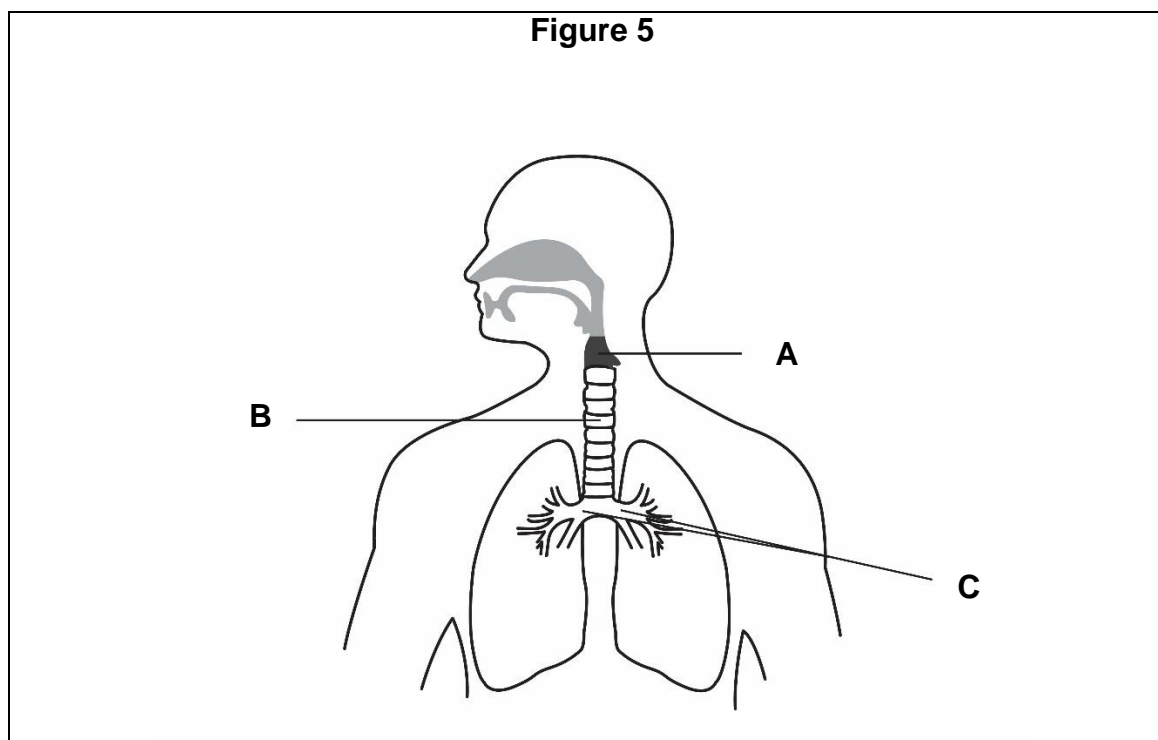
Type of muscle contraction _____

Justification _____

Please turn over for the next question.

12

Figure 5 shows structures in the respiratory system.



- 12 (a)** Identify the structures of the respiratory system labelled **A**, **B** and **C** in **Figure 5**.
[3 marks]

A _____

B _____

C _____

- 12 (b)** Outline the structure of alveoli **and** explain how the structure helps them perform their function.
[4 marks]

- 13 (a)** Identify the type of muscular strength that is needed to perform a standing vertical jump.

Justify your choice.

[2 marks]

Type of muscular strength _____

Justification _____

- 13 (b)** Define 'balance' and 'agility' **and** give **one** example of when you would use each in a health and fitness activity.

[4 marks]

Balance _____

Example activity _____

Agility _____

Example activity _____

- 14 (a)** Define 'vasodilation' and 'vasoconstriction'.

[2 marks]

Vasodilation _____

Vasoconstriction _____

14 (b) (i) Outline the vascular shunt process.

[2 marks]

14 (b) (ii) Give **two** ways that the vascular shunt process helps an individual doing health and fitness activities.

[2 marks]

1

2

15 (a) Smooth muscle is a type of muscle in the body.

State the other **two** types of muscle **and** describe how their function in the body helps an individual doing health and fitness activities.

[4 marks]

1

2

15 (b) Identify a health and fitness activity that would be suited to the following muscle fibre types.

- Type 1 slow twitch fibres
- Type 2 fast twitch fibres

Justify your choices.

[4 marks]

- Type 1 slow twitch fibres

Activity _____

Justification _____

- Type 2 fast twitch fibres

Activity _____

Justification _____

Please turn over for the next question.

- 16 (a)** Heart rate, stroke volume and cardiac output all increase during health and fitness activities.

State **three** other short-term effects of health and fitness activities **and** explain why these occur.

[6 marks]

1 _____

2 _____

3 _____

- 16 (b)** Explain **four** possible long-term effects on the body if an individual does light intensity cardiovascular training over a period of 6 months.

[4 marks]

1 _____

2 _____

3 _____

4 _____

Section 3

This section has a possible 21 marks.

You should spend about 30 minutes on this section.

Answer **all** questions in the spaces provided.

17

Evaluate the importance of the principles of training in health and fitness activities designed to improve muscular strength.

[6 marks]

This is the end of the external assessment.

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