2.5 Movement Analysis: Agonist and Antagonist Muscle Roles: Test Pack

AQA 8582 · Calculators not allowed · about 15 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Which term describes the muscle that contracts to cause a movement, working as the prime mover?

- [ ] A) The agonist
- [ ] B) The antagonist
- [ ] C) The fixator
- [ ] D) The tendon

(Total for Question 1 is 1 mark)

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2 Table 2 describes where five muscles are found and asks for the name of each.

Table 2

Row	Where the muscle is found
(a)	The muscle that forms the bulge on the front of the upper arm
(b)	The muscle group on the back of the thigh
(c)	The muscle on the front of the lower leg, beside the shin bone
(d)	The muscle group on the front of the thigh
(e)	The large muscle that forms the buttock

(a) Name the muscle described in row (a). **(1)**

(b) Name the muscle described in row (b). **(1)**

(c) Name the muscle described in row (c). **(1)**

(d) Name the muscle described in row (d). **(1)**

(e) Name the muscle described in row (e). **(1)**

(Total for Question 2 is 5 marks)

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3 A sprinter injures her quadriceps and cannot use them at full strength. Explain how this would affect her sprinting.

(Total for Question 3 is 2 marks)

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4 During the drive phase of a squat jump, a basketball player extends their knee explosively to leave the ground.

(a) Name the agonist muscle group responsible for this knee extension. **(1)**

(b) Name the antagonist muscle group, and state what it does during this knee extension. **(2)**

(c) Explain how the lever class of the knee joint (a third class lever, with the quadriceps acting close to the knee) relates to the speed of this jumping action. **(2)**

(Total for Question 4 is 5 marks)

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5 Explain why identifying the correct agonist muscle for a joint action is useful information for a coach designing a strength training programme for a specific sporting movement.

(Total for Question 5 is 2 marks)

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Mark scheme · 2.5 Movement Analysis: Agonist and Antagonist Muscle Roles: Test Pack

Question 1

A **B1**

Answer: A

Question 2

(a) biceps brachii, oe **B1**

(a) Answer: Biceps brachii.

(b) hamstrings, oe **B1**

(b) Answer: Hamstrings.

(c) tibialis anterior, oe **B1**

(c) Answer: Tibialis anterior.

(d) quadriceps, oe **B1**

(d) Answer: Quadriceps.

(e) gluteus maximus, oe **B1**

(e) Answer: Gluteus maximus.

Question 3

the quadriceps are the agonist for knee extension, so she would be weaker at straightening her knee, oe **B1**

this would reduce the force and speed of her leg drive (or her stride), so she would sprint more slowly, oe **B1**

Answer: The quadriceps are the agonist for knee extension, so her knee would extend with less force and speed, reducing her leg drive and her sprinting speed.

Question 4

(a) quadriceps **B1**

(a) Answer: Quadriceps.

(b) hamstrings **B1**

(b) the hamstrings relax and lengthen to allow the knee to extend, oe **B1**

(b) Answer: The hamstrings, which relax and lengthen to allow the knee to extend.

(c) the quadriceps inserts close to the knee (fulcrum), giving a short effort arm compared with the load arm (to the foot), so the mechanical advantage is below 1, oe **B1**

(c) this means a fast, powerful contraction of the quadriceps close to the joint produces a much larger, faster extension movement at the foot, which helps drive the explosive jump, oe **B1**

(c) Answer: The quadriceps inserts close to the knee (the fulcrum), giving a short effort arm compared with the load arm to the foot, so the mechanical advantage is below 1; this means a fast, powerful contraction of the quadriceps close to the joint produces a much larger, faster extension movement at the foot, which helps drive the explosive jump.

Question 5

knowing the agonist muscle for a movement lets the coach select exercises that specifically strengthen that muscle, oe **B1**

so the training directly targets the muscle responsible for producing power in the sporting movement, rather than training muscles that are less relevant to that specific action, oe **B1**

Answer: Knowing the agonist muscle for a movement lets a coach select exercises that specifically strengthen that muscle, so the training directly targets the muscle responsible for producing power in the sporting movement, rather than training muscles that are less relevant to that specific action.

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