

**Year 11 ATAR Human Biology**

**Task 3: Lifestyle Choices Musculoskeletal System**

**Extended Response ANSWERS!!!**

Time Allocated: 50 minutes

Weighting 7.5%

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| **Question 1** | **Question 2** | **Question 3** | **Total** |
| /8 | /8 | /10 | /26 |

Comments:

**Answer the following 3 questions below ensuring to include full detail and sentence structure in your responses. You can choose how to structure your answer and may include labelled diagrams or tables if appropriate.**

**1)** After 30 years of age a person’s bones begin to gradually deteriorate. Explain the **two effects** of aging on the skeletal system. In your answer discuss the **treatments** and **symptoms** available for each. (8 marks)

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|  |
| Osteoperosis – loss of bone mass (1) no marks for just name |
| Osteoarthritis – deterioration of cartilage in joints (1) |
|  |
| Treatment – Op – increase calcium, increase exercise, increase vit D, quit smoking, medication. (any 2) |
| Treatment – Oa – medication for pain relief, Surgery, Physiotherapy (any 2) |
| Symptoms Op – an increased risk of fracture |
| Symptoms – Oa – stiffness in joints/pain |

**2)** Using examples, explain **four** types of movement that occur at a joint. (8 marks)

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|  |
| Any four of the following (1 mark for description, 1 mark for example) (no marks for just name) |
| Flexion – decrease angle between bones – bending elbow |
| Extension – Increasing angle between bones – Straightening armor leg |
| Abduction – movement away from midline – lifting arm away from body |
| Adduction – movement towards midline – returning arms to side |
| Rotation – movement of bone around long axis – rotation of shoulder |

**3) List** the components of myofibrils and **describe** their structure. Use these terms to **explain** muscular **contraction** and **relaxation** using the sliding filament model. (10 marks)

Myofilaments are proteins (1/2) which are the actual units involved in muscular contraction (1/2)

Thick filaments (1/2) which are mainly made of the protein myosin (1/2)

Thin filaments (1/2) which are mainly made of the protein actin (1/2)

The sarcomere (1/2) are the division of myofibrils. They create the appearance of muscle striations (1/2)

When muscles contract, the sarcomeres shorten (1 mark)

Thin actin filaments slide over thick myosin filaments (1 mark)

Z lines draw closer together, muscle contracts (1 mark)

When muscles relax, sarcomeres return to relaxed position (1 mark)

Muscles relax, causing the actin and myosin to be pulled past one another in opposite directions (1 mark)

Muscle fibre returns to original, uncontracted length (1 mark)

**END OF ASSESSMENT**