

**Year 11 Human Biology**

**Extended Response: Musculoskeletal System and DNA**

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| Name: |
| Teacher: |

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|  | Marks Available | Marks Achieved |
| Question 1 | 14 |  |
| Question 2 | 8 |  |
| Question 3 | 8 |  |
| Total | 30 |  |

Assessment Time: 55 minutes

Weighting: 5%

**Extended Response: Muscular Skeletal System and DNA**

**1 a)** Protein synthesis involves two stages, transcription and translation. Describe the main steps in transcription. (6 marks)

**1 b)** Briefly explain the term gene expression ad describe in detail **two** changes that can affect the likelihood of gene expression.

(8 marks)

**2)** 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)

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

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| 1a |
| (1)DNA – transcribed to mRNA  (1)mRNA is able to move out of the nucleus (DNA is too big) |
| (1)Helicase unzips DNA |
| (1)RNA Polymerase copies base pairs |
| (1)Mention examples of base pairs – AT and CG (accept AU) |
| (1)Strand copied is known as the template strand |
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| 1b |
| 1. Gene expression – when genes used to make mRNA are either switched on or switched off. |
| 1. Chromatin – Acetylation is the addition of an acetyl group which activates genes(1) – Methylation – Cytosine adjacent to guanine inhibits genes (1) |
| 1. Environmental – Stress, nutritional factors, toxins/drugs (any two) (1 each) |
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| 2. |
| Osteoperosis – loss of bone mass (1) no marks for just name |
| Osteoarthritis – deterioration of cartilage in joints (1) |
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| 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 |
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| 3 |
| 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 |
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