

Q1. A [1]

Q2. C [1]

Q3. B [1]

Q4. B [1]

Q5.

Award **one** mark for each of the following points up to a maximum of four marks. Award up to a maximum of two AO1 marks and up to a maximum of two AO2 marks.

- Cranium (1 × AO1)
- Provides protection for the brain whilst heading a football / equivalent (1 × AO2)
- Sternum (1 × AO1)
- Provides protection to the heart when controlling a football on the chest / equivalent (1 × AO2)
- Scapula (1 × AO1)
- Provides protection for the shoulder joint during contact made with another player when catching a netball / equivalent (1 × AO2)
- Ribs (1 × AO1)
- Protect the lungs during any impact with a hockey ball / equivalent (1 × AO2)
- Pelvis (1 × AO1)
- Protects the reproductive system / bladder during contact made in a rugby tackle / equivalent (1 × AO2)

The bones can be credited for AO1 (up to a maximum of 2 marks) but the example must be applied to the protective role of the named bone during a sporting action for AO2 (up to a maximum of 2 marks). Alternative appropriate sporting actions can be credited.

[4]

Q6.

(a) Award **one** mark for each of the following points up to a maximum of one mark.

- Ball and socket (1)

(b) Award **one** mark for each of the following points up to a maximum of two marks.

- Shape of the articular surface / bones – allows bones to fit together (1)
- Ligaments – attach bone to bone / restrict movement (1)
- Joint capsule / fibrous capsule – lined with synovial membrane / encloses / supports / joints (1)
- Synovial membrane – secretes synovial fluid (1)
- Synovial fluid – provides lubrication (1)
- Cartilage (hyaline / articular) – prevents friction / stops bones rubbing together (1)
- Bursae (sacks of fluid) – to reduce friction (1)

Accept any other suitable explanation of features of the shoulder joint that prevent injury occurring.

Answers must refer to the shoulder joint.

2

[3]

#### Q7.

Award **one** mark for each of the following points up to a maximum of three marks. Answers must refer to the movement from A to B

- Bicep is the agonist / the prime mover which contracts / shortens to cause the movement from A to B (1)
- Biceps are attached to bones in the lower arm via tendons (1)
- Biceps contraction causes a pull on the bones in the lower arm (radius) (1)
- Causing flexion at the elbow (1)
- Tricep is the antagonist which relaxes / lengthens during the movement (1)
- Contraction of the bicep allows movement at the third class lever (1)

Accept any other suitable explanation of how the muscles and bones work together to produce the movement from Position A to Position B.

[3]

#### Q8.

Award **one** mark for correctly stating that abduction is movement of a limb away from the midline of the body (1)

Award **one** mark for a suitable sporting example used to explain abduction movement

(1)

[2]

**Q9.** (i) Award **one** mark for each correctly named bone in the leg

- bones – femur, tibia, fibula, patella 3

(ii) Award **one** mark for each correctly named muscle in the leg

- muscles – gastrocnemius, soleus, hamstring group, gluteals, quadriceps group 2

[5]

**Q10.** (i) Award **one** mark for **each** correct function of the skeleton other than movement.

- Support
- Protection
- Shape/ structure
- Blood cell production
- Storage of minerals/ Mineral storage.

3

(ii) Award up to **two** marks for a correct explanation.

- Cushions between bones
- To stop rubbing during movement
- Acts as a shock absorber
- Stabilises joints
- Prevents excess movement
- Allows easier movement

Accept the above or any other acceptable answer.

2

[5]

**Q11.** (i) Award up to **two** marks for correctly explaining what extension is:

- The increasing of an angle/between two bones
- A joint which is straightened so that one of the bones of the joint moves/away from the other
- The action of opening/ a joint.

2

(ii) Award **one** further mark for **each** correct example given:

- Straightening the leg at the knee when kicking a football
- Straightening the arm at the elbow when throwing a ball
- A correct actual example such as performing a triceps extension.

Accept the above plus any other suitable examples.

2

(iii) Award **one** mark for correctly stating that plantar flexion is movement at the ankle joint that points the toes/ points the toes towards the ground and increases the angle at the joint

Award **one** mark for a suitable sporting example used to explain plantar flexion movement

2

(iv) Award **one** mark (of 3 marks) for stating the following:

- Bones and muscles work together to create movement around a joint
- Muscles are attached to bones by tendon
- Muscular contractions by muscles around a joint produce movement of the articulating bones of that joint, creating movement. These contractions can be isometric or isotonic (concentric/ eccentric) contractions.
- Muscles work in antagonistic pairs which allows movement of bones around a joint to take place.

3

Award **one** further mark for providing a suitable sporting example used to explain how the skeletal system and muscular system work together to produce movement.

1

[10]

## Q12

(i) Award **one** mark for each of the following:

- (a) Concentric contraction
- (b) Eccentric contraction

2

(ii) Award **two** marks for a description outlining that concentric contractions are:

- When the muscle contracts and shortens
- Is the muscle that is the prime mover (agonist)

Award **two** marks for a description outlining that eccentric contractions are:

- When the muscle contracts and lengthens
- Is the muscle that is the antagonist in an antagonistic muscle pair.

4

[6]

## Q13.

Award **one** mark for:

- The cardio-respiratory system is made up of the circulatory (heart, blood vessels and blood) and the respiratory system (lungs and airways).

1

Award **one** mark for:

- Enables the body to breathe/ pumping blood and oxygen around the body

1

[2]

## Q14.

Award **one** mark for:

Rings of cartilage -

- Gives the trachea its shape and structure
- Prevents the trachea collapsing

1

Award **one** mark for:

Cilia -

- Tiny hairs to trap foreign objects (dust/ dirt) in the air to prevent them entering the lungs before being coughed out the nose/ mouth.

1

[2]

**Q15.**

Award **one** mark for each of the following:

- The chest cavity changes shape and size
- The diaphragm flattens and moves downwards
- The intercostal muscles contract, raising the ribs up
- The air pressure inside the chest cavity reduces causing air to rush in
- Air moves from an area of high concentration to an area of low concentration.

[3]

**Q16.**

(i) Award **one** mark for **nose** and **one** mark for **mouth**

2

(ii) Award **one** mark for:

- Gaseous exchange is the process where oxygen from the air diffuses from the alveoli into the blood stream and carbon dioxide from the blood stream diffuses into the alveoli.

1

Award **one** mark for each of the following:

- Oxygen breathed in passes through the alveoli and into the red blood cells in the capillaries/ oxygen then combines with haemoglobin to form oxyhaemoglobin and is carried around the body/ haemoglobin carries carbon dioxide from the body to the capillaries/ the carbon dioxide in the capillaries passes through the alveoli and is breathed out.
- Gaseous exchange occurs in the alveoli and capillaries.

2

(iii) Award **one** mark for:

- Diffusion is the process of gases (including oxygen and carbon dioxide) moving from an area of high concentration to an area of low concentration. The distance the molecules travel is called diffusion pathway.
- Oxygen diffuses into the blood from an area of high concentration in the alveoli to an area of low concentration in the blood.

- Carbon dioxide diffuses from an area of high concentration in the blood to an area of low concentration in the alveoli

3

[8]

**Q17.** Award **one** mark for:

The normal amount of air inhaled or exhaled per breath/ tidal volume increases with exercise.

[1]

**Q18.** Award **one** mark for:

The largest volume of air that can be forcibly exhaled after the deepest possible inspiration.

[1]

**Q19.** Award **two** marks for:

Artery exiting the heart from the right ventricle

Carries deoxygenated blood from the right side of the heart to the lungs

[2]

**Q20.** Award **one** mark for each of the following:

- The cardio-respiratory system is made up of the circulatory (heart, blood vessels and blood) and the respiratory system (lungs and airways).
- Oxygenated air is inhaled through the nose and the mouth which travels down the trachea, splits into the left and the right bronchus and is spread through each lung by the bronchioles, finally reaching the alveoli.
- The trachea is made up of rings of cartilage which hold it open and give it structure. Tiny hairs called cilia are present in the trachea which trap dust and dirt particles to prevent them reaching the lungs.
- Gaseous exchange takes place in the alveoli and capillaries. One mark for a suitable explanation of the process of gaseous exchange.
- Award one mark for a suitable explanation of the process of diffusion and diffusion pathway.
- After gaseous exchange oxygenated blood is transported to the heart via capillaries, arterioles and arteries.
- Award one mark for a suitable description of the path of blood through the heart.
- Award one mark for a suitable description/ explanation of gaseous exchange occurring between the capillary and working muscle.
- Deoxygenated blood (rich in CO<sub>2</sub>) is transported back to the heart via capillaries, venuoles and veins and is sent back to the lungs where gaseous exchange occurs between the capillaries and alveoli.
- Deoxygenated air is transported through bronchioles, left and right bronchus, trachea and then breathed out of the nose and mouth.

[7]

