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SECTION A: The Skeletal System for Sports Performance

Answer ALL questions. Write your answers in the spaces provided.

1 Complete **Table 1** by naming the **three** bones in the shoulder joint. 3 Q01

Joint	Name of bone
Shoulder	Humerus
	Scapula
	Calvicle

Table 1

(Total for Question 1 = 3 marks) **3**

Carmen is a long jumper. The functions of different bone types are vital to ensure that she can participate in the long jump. Two of these bone types are short bones and sesamoid bones.

2 Explain how short bones **and** sesamoid bones support Carmen when performing the long jump. 0 Q02

Short bones such as tarsals help in movement to point the foot upwards and straight for a long jump

Sesamoid bones such as patella helps Knee to bend because the leg can contract first than it relaxes.

(Total for Question 2 = 4 marks) **0**

Figure 1 shows a gymnast on the beam.

Figure 1

3 (a) (i) State the movement taking place at the ankle joint circled in **Figure 1**.

(1) 0 Q03ai

Hinge Jo

(ii) State the type of joint found at the ankle.

(1) 1 Q03aii

Hinge joint

(b) State the movement taking place at the shoulder joints in **Figure 1**.

(1) 0 Q03b

Circumduction

(c) Explain why the ligaments in the knee are important when the gymnast lands from the beam.

(3) 0 Q03c

(Total for Question 3 = 6 marks) 1

TOTAL FOR SECTION A = 13 MARKS

SECTION B: The Muscular System for Sports Performance

Answer ALL questions. Write your answers in the spaces provided.

Figure 2 shows the muscles in the upper body.

4 Identify the muscles labelled **A–C**.

2 Q04

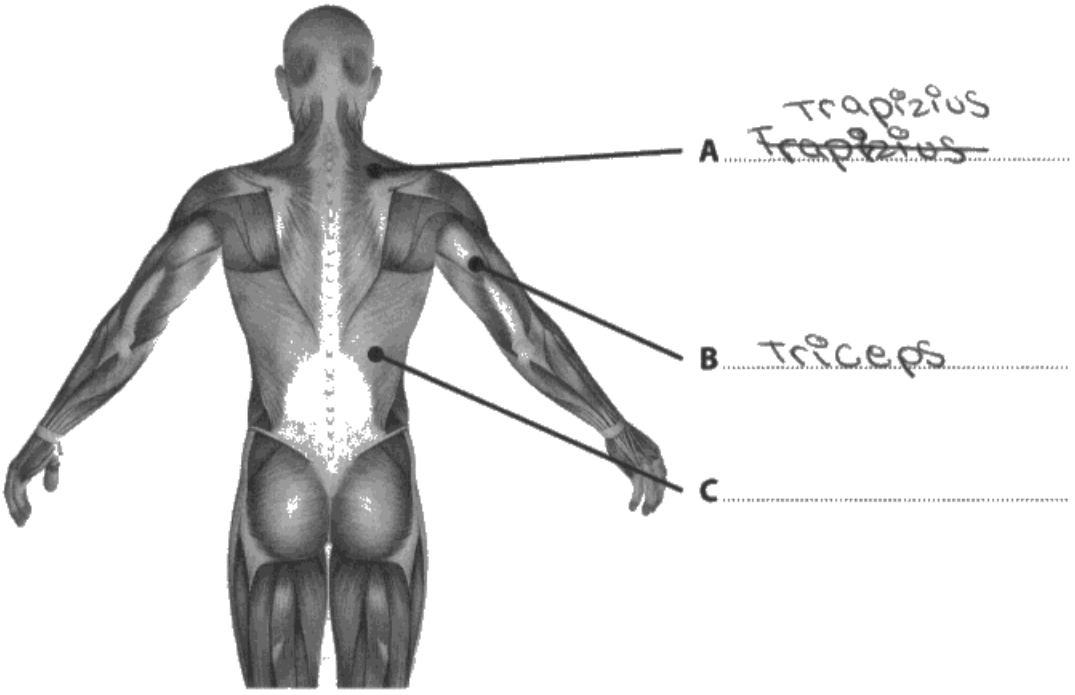
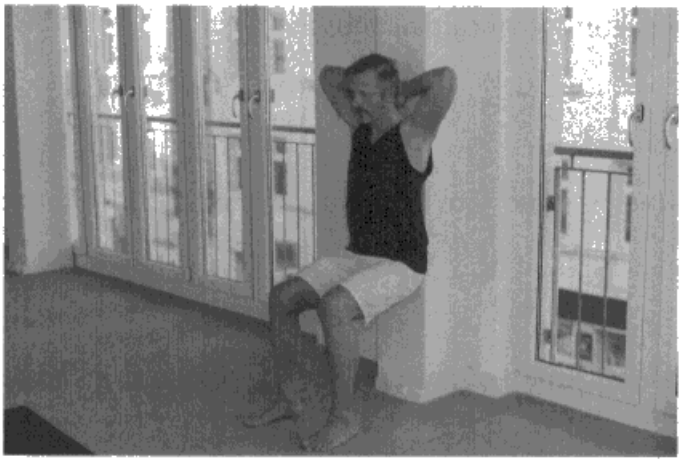


Figure 2

(Total for Question 4 = 3 marks) 2

Figure 3 shows Dave performing a wall sit.

Concentric → Short
eccentric → length
Isometric → same



(Source: © stockfour/Shutterstock)

Figure 3

5 Describe the type of muscle contraction taking place in Dave's quadriceps when he performs a wall sit. 0 Q05

• Concentric contraction

• which Dave's quadriceps ~~shorl~~ contracts and shortens.

(Total for Question 5 = 2 marks) 0

There are three muscle fibre types: Type I, Type IIa and Type IIx.

6 Explain the main fibre type used in long-distance running. 0 Q06

• Type IIa, slow, long-distance run less fatigue

(Total for Question 6 = 3 marks) 0

One characteristic of cardiac muscle is that it is involuntary.

7 (a) State **one other** characteristic of cardiac muscle.

(1) 0 Q07a

voluntary

(b) State **one** reason why it is important that cardiac muscle is involuntary.

(1) 0 Q07b

To adapt in the working muscles.

Priya is a cyclist. Over a long period of time, Priya's muscular system has adapted causing an increase in myoglobin stores.

(c) Explain the impact of an increase in myoglobin stores on Priya's performance in a cycling race.

(3) 0 Q07c

Her body will adapt with stronger muscle contraction.
Myoglobin is increase aswell the ~~thral~~ Thoracic cavity is increased.
Mineral depletion

(Total for Question 7 = 5 marks) 0

TOTAL FOR SECTION B = 13 MARKS

SECTION C: The Respiratory System for Sports Performance

Answer ALL questions. Write your answers in the spaces provided.

Figure 4 is an incomplete flow diagram of the route that air passes through when breathing in.

8 Identify the **three** respiratory structures needed to complete the flow diagram shown in **Figure 4**. 3 Q08

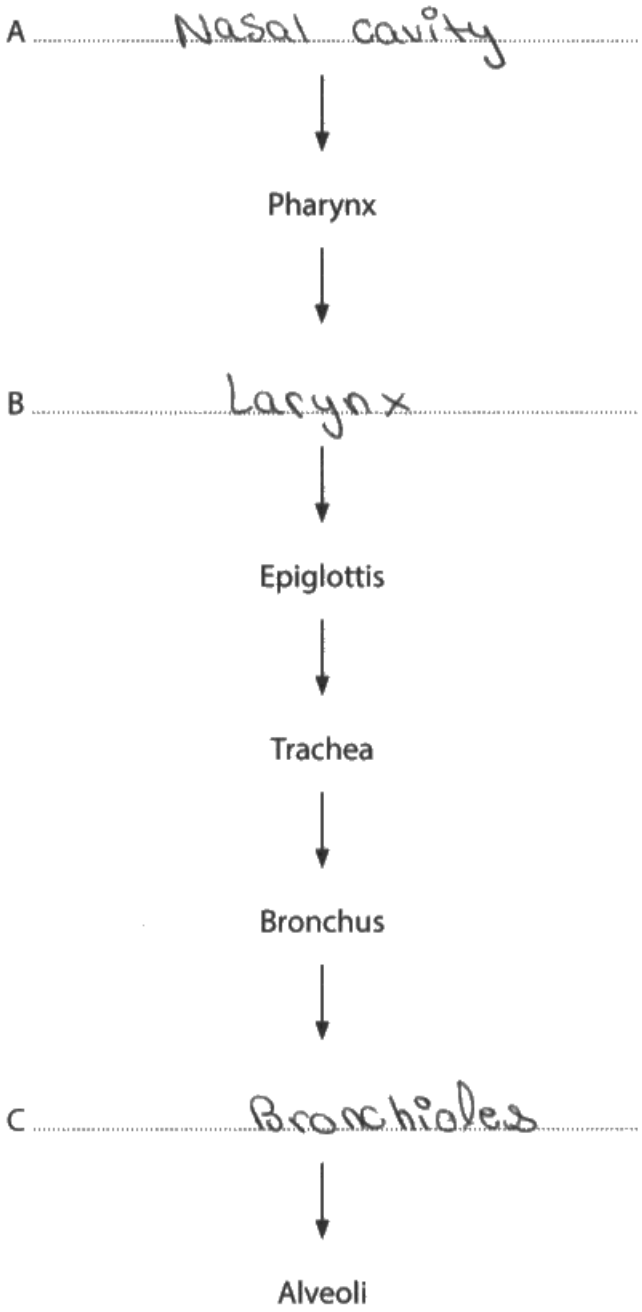


Figure 4

Bronchioles

(Total for Question 8 = 3 marks) 3

9 (a) Describe how the medulla oblongata increases breathing rate during exercise.

(2) 0 Q09a

It sends signals to the body, in working muscles releases Oxygen and waste products.

(b) (i) Describe the process of diffusion of carbon dioxide at the alveoli.

(4) 1 Q09bi

Process of O_2 passes to ~~the~~ carbon dioxide to take away waste product. A diffusion rate ~~conte~~ concentration of high to low.
Alveoli releases the waste products

(ii) Describe the role of the internal intercostal muscles during expiration when exercising.

(2) 0 Q09bii

Lungs will ~~expell th~~ be ~~expelled~~ ~~exhaled~~ expand while breathing where diaphragm is extended

Dexter is a hockey player. He has completed a continuous training programme over a number of weeks. He now runs for 45 minutes, five times a week.

His training has led to an increase in the oxygen diffusion rate at his muscles.

(c) Assess the effect of an increase in oxygen diffusion rate at his muscles on Dexter's hockey performance.

(6) 0 Q09c

The diffusion gradient has a high to low concentration. An increase in oxygen leads to respiratory where the diaphragm will inhale and exhale faster and loss of energy into the working muscle which will ~~of~~ effect his overall performance to be tired quickly and ~~efatie~~ fatigue. ~~If the person's in a hypothermia~~, His ~~hypothea~~ hypotrophy will ~~dre~~ decrease in size and number. This could lead to dizziness and ~~cramp the~~ ~~muscle~~ muscle tissues will be impacted. This means Dexter perform in a certain way to maintain his working muscle to stop fatiguing or in a set of temperatur such as hyperthermia really hot or hypothermia really cold.

(Total for Question 9 = 14 marks) 1

TOTAL FOR SECTION C = 17 MARKS

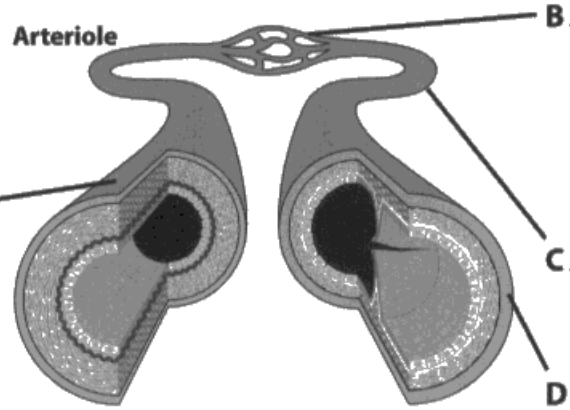
SECTION D: The Cardiovascular System for Sports Performance

Answer ALL questions. Write your answers in the spaces provided.

Figure 5 shows the various types of blood vessel.

1 Q10

10 Name the blood vessels labelled **A–D** in **Figure 5.**



A ligament

B Capillaries

C .....

D Plasma

(Source: © Blamb/Shutterstock)

Figure 5

(Total for Question 10 = 4 marks) 1

Emma is a netballer. During a match some of her blood vessels vasodilate.

11 (a) Explain why vasodilation helps Emma perform in the netball match on a very hot day.

(2) 0 Q11a

Increased blood vessels hyperthermia is occured helps maintain body staible

During the match, one response of Emma's cardiovascular system is redirection of blood flow.

(b) State **three other** responses of the cardiovascular system during the match.

(3) 0 Q11b

1 Red blood cell use the most oxygen

2 Prevent collagen

3 Fatigue

(Total for Question 11 = 5 marks) **0**

12 Describe the role of the tricuspid valve in the cardiac cycle.

0 Q12

Blood from the vena cava pass to the right-atrium ~~semi-lunar~~ into the ~~body and muscles.~~ tricuspid valve left blood to pump in right ventricle the out from semi-lunar to the working muscles.

(Total for Question 12 = 2 marks) **0**

Leah is a footballer. She relies on her cardiovascular system to allow her to play a full match. 4 Q13

13 Analyse the flow of blood as it returns to the heart through the vena cava until it is pumped out to the body **and** how this helps Leah last the full match.

The blood is entered from the lungs into the right side of heart through vena cava pass to the right atrium, then tricuspid valve which then blood is pumped int the right ventricle. After it goes to semi-lunar from these it is sent to left ventricle fill up the blood pump again goes through Bicuspid valve to left atrium and from pulmonary vein get to the pulmonary artery which deoxygenated blood to enter the body. This help leah's Cardiovascular system to maintain her blood staible while performing less risk to damage the blood flow being pumping too high which leads to hypotrophy where the size and number decreases in the heart.

(Total for Question 13 = 6 marks) 4

TOTAL FOR SECTION D = 17 MARKS

SECTION E: Energy Systems for Sports Performance

Answer ALL questions. Write your answers in the spaces provided.

14 State the **two** by-products of the electron transport chain.

0 Q14

1 waste products

2 Release of carbon dioxide

(Total for Question 14 = 2 marks) **0**

15 Describe the process of **anaerobic** glycolysis.

1 Q15

Anaerobic glycolysis process uses no use of oxygen releases CO_2 as a waste produt which makes energy in the body or working muscles.

Use of ATP-PC energy ~~syp~~ system after the breakdown ~~phor~~ forming phophocreatine level build-up to resynthesis the ATP system.

(Total for Question 15 = 4 marks) **1**

Erin is a rugby player. She has been training for five years. Over this time her aerobic energy system has adapted.

16 Assess the impact of adaptations to the aerobic energy system on Erin's rugby performance.

0 Q16

O_2 is adaptate to the working muscles, ~~as it is~~ a long-term adaptation makes body stabalised to use the ATP, 1-3sec energy system. However, ATP is than ~~breakdwo~~ breakdown which form ATP-PC system it is a short brust in the performance.

The rugby performance in use of aerobic energy system it is useful to lactate the fuels of source, PC, this will impacton Erin's performance to use the energy the most. Her muscles are staibalised by the training which means she will perform under tension with high working intensity.

(Total for Question 16 = 6 marks) **0**

TOTAL FOR SECTION E = 12 MARKS

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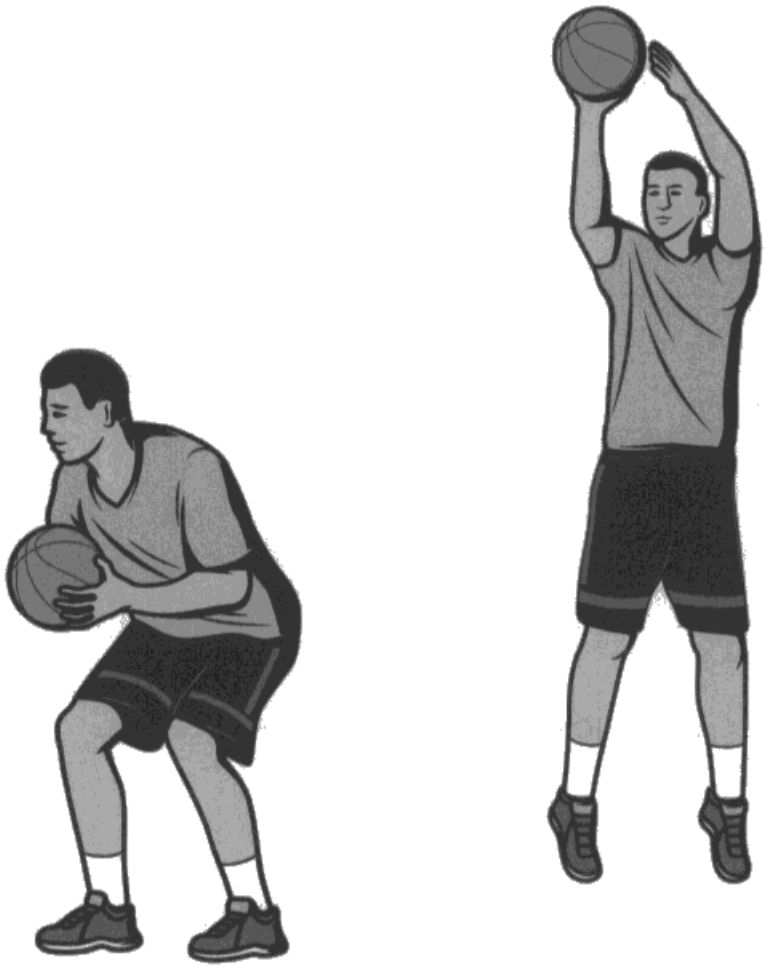
QUESTION 17 BEGINS ON THE NEXT PAGE.

SECTION F: Interrelationships between Body Systems for Sports Performance

Answer the question. Write your answer in the space provided.

Josh is a basketballer.

Figure 6 shows the preparation phase (position A) and the shooting phase (position B) of his jump shot.



Position A Position B

(Source: © Seamartini/Alamy Stock Vector)

Figure 6

17 Analyse how the skeletal and muscular systems interact to enable movement of the knee, hip and elbow from position A to position B in **Figure 6**.

(8) 1 Q17

In Position A his he has interated with Knee the use of Sesamoid bone which is patella bending over his knee is a hinge joint he is in a set position ~~of~~ to form

a muscle contraction of concentric contraction where his hamstrings and Quadriceps are shorten in the lower body.

The upper body in Position A such as his holding the ball but his position of back is slightly fawards to make a high jump to goal.

In the position B Josh has changed his whole body's position where he uses the movement in Arms but in the lower body his legs went straight as a eccentric contraction, it contracts and lengthas underloaded or in tension. His movement in ankle use of torsos a hinge joint. Also his arm at ball and socket joint has circumduction movement to through the ball for a goal.

In this preparation he has used most of legs and arm in a Certain way to use the specific muscle movement which enable him contract into the right mark.

(Total for Question 17 = 8 marks) 1

TOTAL FOR SECTION F = 8 MARKS
TOTAL FOR PAPER = 80 MARKS