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PHYSICAL EDUCATION

0413/12

Paper 1 Theory

May/June 2023

1 hour 45 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

INFORMATION

- The total mark for this paper is 100.
- The number of marks for each question or part question is shown in brackets [].

This document has **20** pages. Any blank pages are indicated.

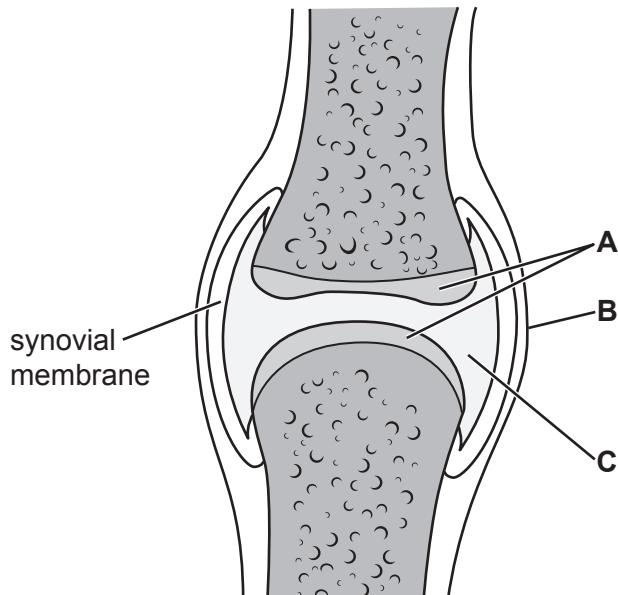
- 1 Identify each type of blood vessel described.

type of blood vessel 1: thick elastic walls; transports oxygenated blood away from the heart

type of blood vessel 2: walls are one cell thick; allows certain substances to pass into and out of cells

[2]

- 2 The diagram shows a typical synovial joint.



- (a) Identify the components of the joint labelled **A**, **B** and **C**.

A

B

C

[3]

- (b) Describe a function of the synovial membrane.

..... [1]

- (c) (i) Identify the type of synovial joint found at the knee.

..... [1]

- (ii) Identify **two** bones that form the joint at the knee.

1

2

[2]

[Total: 7]

- 3 Some performers choose to use blood doping to gain an unfair advantage.

- (a) Describe how blood doping is carried out.

.....
.....
.....
.....
.....
.....
.....
.....

[3]

- (b) Describe the potential side effects of blood doping on a performer.

.....
.....
.....
.....

[2]

[Total: 5]

- 4 A sprinter has set themselves the following goal:
'To improve my personal best time for 100 metres by 0.2 seconds by the end of the season.'

- (a) Identify **three** named SMARTER goal-setting principles. Explain how each principle has been applied to this goal.

principle 1

application

.....
principle 2

application

.....
principle 3

application

[6]

- (b) Identify a goal-setting principle that has **not** been applied in setting this goal.

Suggest how **not** applying the named principle could cause the sprinter **not** to achieve their stated goal.

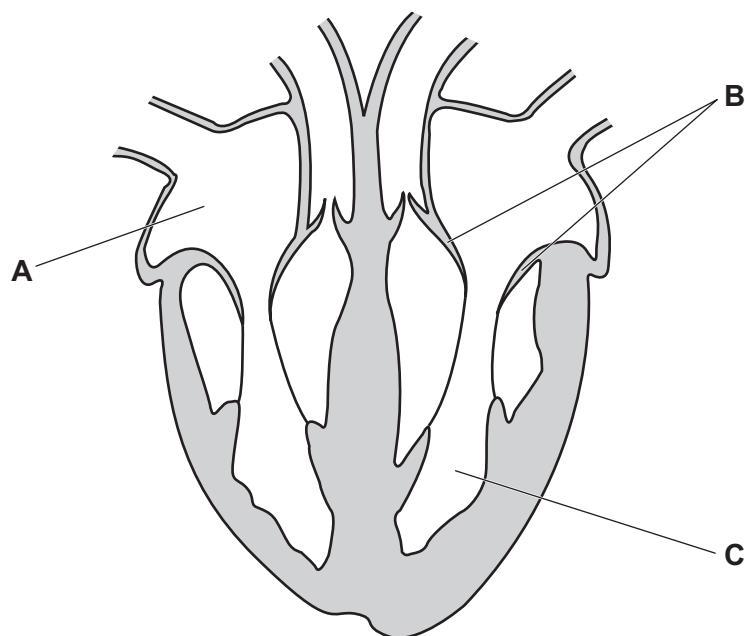
principle

cause

[2]

[Total: 8]

- 5 The diagram shows the human heart with structures labelled **A**, **B** and **C**.



- (a) Identify the structures labelled **A** and **C**.

A

C
[2]

- (b) Identify the structure labelled **B** and describe its function.

B

function

[2]

- (c) Describe a function of the pulmonary vein in the pathway of blood through the heart.

.....
..... [1]

[Total: 5]

- 6 For each of the following suggest a different disadvantage of sponsorship:

a professional football team

.....
an international athletics event

.....
a sponsor.

[3]

- 7 Complete the table to show the agonist muscle (prime mover), the antagonist muscle, the movement created by the agonist muscle and an example of when the movement is used in a physical activity.

agonist muscle (prime mover)	antagonist muscle	movement	example of movement
	triceps	flexion	
	hamstring group		straightening the leg when kicking a ball in football
gastrocnemius			standing on tip toes when preparing to dive into a swimming pool

[6]

8 Circuit training is a method of training often used by games players.

(a) Suggest **three** advantages for a games player of using circuit training.

1

.....

2

.....

3

[3]

(b) Suggest **two** different disadvantages for a games player of using each of the following methods of training:

plyometric training

1

.....

2

.....

continuous training.

1

.....

2

.....

[4]

- (c) Describe **three** mental health benefits a performer might gain from playing in a sports team.

1

.....
2

.....
3

[3]

[Total: 10]

- 9 A performer may adjust their diet to suit their physical activity.

- (a) Compare the energy needs of teenagers with the energy needs of young children. Justify your answer.

energy need

justification

[1]

- (b) Describe, using a named physical activity, **two** possible negative physical effects for a performer if they do **not** achieve a balanced diet.

physical activity

negative effect 1

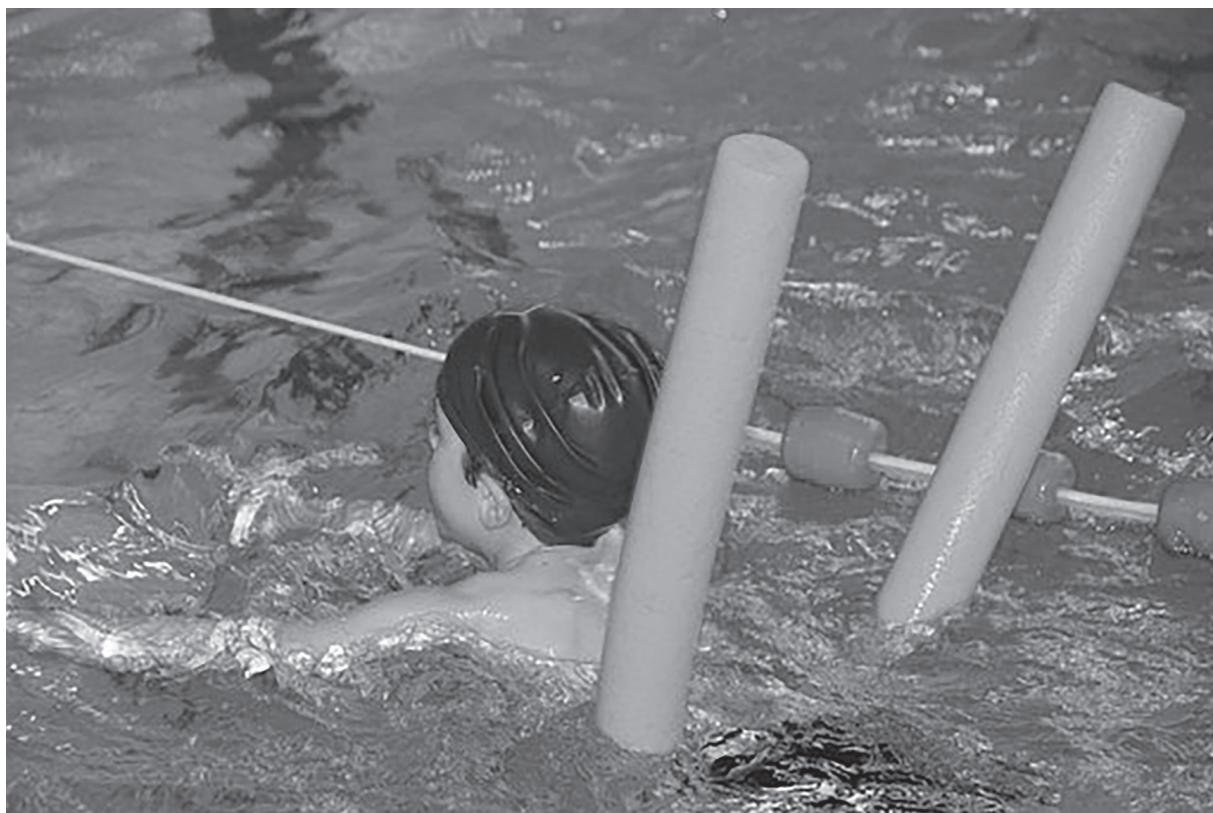
.....
negative effect 2

[2]

[Total: 3]

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- 10 The photograph shows a swimmer using a flotation aid to help them to learn to swim safely.



- (a) (i) Describe what is meant by a perceived risk.

..... [1]

- (ii) Identify **three** real risks that could occur when swimming in a pool. Describe a different strategy, other than using a flotation aid, to reduce each risk.

risk 1

.....

strategy

.....

risk 2

.....

strategy

.....

risk 3

.....

strategy

[6]

- (b) When learning how to swim, a performer may become anxious.

Explain how a relaxation technique can help reduce a performer's level of anxiety.

method

explanation

[2]

[Total: 9]

11 (a) Describe **two** features of play.

1

.....
2

[2]

(b) Explain how **two** named factors, other than a person's age and interests, can influence the recreational activities they take part in.

factor 1

explanation

.....
factor 2

explanation

[4]

[Total: 6]

12 When learning a skill, a performer may go through three stages of learning.

- (a) Identify the first and third stages of learning. Using examples from a named physical activity describe **two** different characteristics of a performer at each stage.

physical activity

first stage of learning

characteristic 1

.....

characteristic 2

.....

third stage of learning

characteristic 1

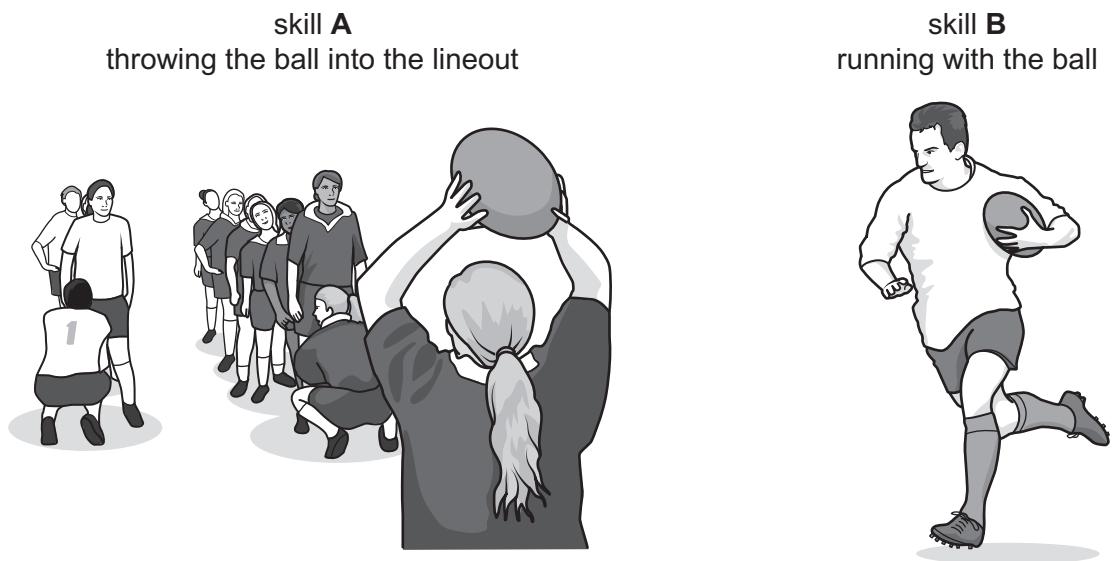
.....

characteristic 2

.....

[6]

- (b) The diagrams show skills that are performed in rugby.



On the basic and complex continuum shown, place the letters **A** and **B** to represent the skills. Justify the placement of each skill.

basic _____ complex

justification

.....

.....

.....

[2]

- (c) Feedback is important when learning skills.

Describe how **two** named types of feedback could benefit a performer at the first stage of learning.

type of feedback 1

benefit

.....

type of feedback 2

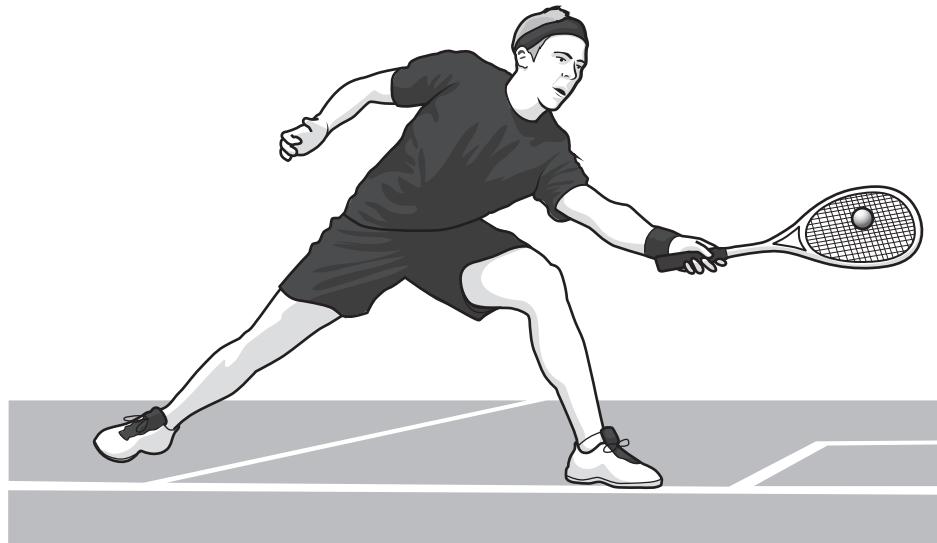
benefit

.....

[4]

[Total: 12]

- 13 The diagram shows a performer hitting the ball during a squash match.



When the performer hits the ball, a force is applied.

- (a) Define the **two** named concepts used to calculate force.

concept 1

definition

.....
concept 2

definition

.....

[4]

- (b) Identify **two** forces that act on the ball as it is hit by the performer.

1

2

[2]

[Total: 6]

14 Energy can be released aerobically or anaerobically.

- (a) Complete the equation that outlines how energy is released aerobically.



[1]

- (b) A sprinter may experience fatigue in their muscles caused by lactic acid.

- (i) Explain why lactic acid forms in a sprinter's muscles.

.....
.....
.....
..... [2]

- (ii) Describe how a performer may assist the removal of lactic acid from their muscles.

.....
.....
.....
..... [2]

[Total: 5]

- 15 The photograph shows a rower during a rowing (sculling) race who requires a high level of cardiovascular endurance / stamina and muscular endurance to perform well.



Explain the importance of **two** other named components of fitness for a rower.

component of fitness 1

explanation

.....

component of fitness 2

explanation

.....

[4]

- 16 (a) Define $\text{VO}_2 \text{ max}$.

.....
.....

[1]

- (b) (i) Four track and field athletes are listed.

400-metre runner 100-metre sprinter marathon runner discus thrower

From this list, state the athlete that is likely to have the highest $\text{VO}_2 \text{ max}$. Justify your answer.

athlete likely to have the highest $\text{VO}_2 \text{ max}$ value

justification

[2]

- (ii) Suggest how an athlete's lifestyle may reduce their $\text{VO}_2 \text{ max}$ level.

.....
.....
.....
.....

[2]

- (c) One characteristic of the alveoli is their walls are one cell thick which allows for gaseous exchange to take place quickly.

Identify **two** other characteristics of the alveoli and describe how each enables gaseous exchange to take place.

characteristic 1

description

.....
characteristic 2

description

[4]

[Total: 9]

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