

Physical Education
COMPONENT 1: Fitness and Body Systems

Total Marks

Wednesday 22 May 2024 – Afternoon

Time: 1 hour 30 minutes

In the boxes below, write your name, centre number and candidate number.

Surname					
Other names					
Centre Number					
Candidate Number					

YOU MUST HAVE

Nil

YOU WILL BE GIVEN

Diagram Booklet

INSTRUCTIONS

Answer ALL questions in Sections A, B and C.

Answer the questions in the spaces provided in this Question Paper or in the separate Diagram Booklet – there may be more space than you need.

INFORMATION

The total mark for this paper is 80.

The marks for EACH question are shown in brackets – use this as a guide as to how much time to spend on each question.

There may be spare copies of some diagrams in case you need them.

ADVICE

Read each question carefully before you start to answer it.

Try to answer every question.

Check your answers if you have time at the end.

Turn over

Answer ALL questions.

Write your answers in the spaces provided.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

SECTION A

Applied anatomy and physiology and movement analysis

- 1 (a) Which ONE of the following body systems protects the vital organs?
(1 mark)**

☐ **A Cardiovascular**

☐ **B Muscular**

☐ **C Respiratory**

☐ **D Skeletal**

(continued on the next page)

1 continued.

(b) Which ONE of the following describes when VASOCONSTRICTION would take place in the digestive system?
(1 mark)

- ☐ **A Immediately after the performer has eaten**
- ☐ **B When the performer is active**
- ☐ **C When the performer is at rest**
- ☐ **D When the performer needs increased blood flow to the digestive system**

(continued on the next page)

1 continued.

Look at FIGURE 1 for Question 1(c) in the Diagram Booklet. It shows a graph of changing lung volumes.

**(c) Which letter, A, B, C or D, represents tidal volume?
(1 mark)**

☐ **A**

☐ **B**

☐ **C**

☐ **D**

**(d) Which ONE of the following structures allows gas exchange with the capillaries?
(1 mark)**

☐ **A Alveoli**

☐ **B Bronchi**

☐ **C Bronchioles**

☐ **D Diaphragm**

(Total for Question 1 = 4 marks)

- 2 The ankle and shoulder are examples of joints in the human body.**

Look at TABLE 1 for Question 2(a) and 2(b) in the Diagram Booklet. Complete TABLE 1 by:

- (a) Stating the classification of each joint.**
- (b) Stating ONE DIFFERENT range of movement for each joint.**

Ligaments and tendons have an important role within the body.

- (c) (i) State the role of LIGAMENTS.
(1 mark)**

(continued on the next page)

2(c) continued.

- (ii) Explain, using an example, why TENDONS are important to games players.
(3 marks)**

(Total for Question 2 = 8 marks)

Turn over

- 3 Look at FIGURE 2 for Question 3 in the Diagram Booklet. It shows the muscular system.**

Look at TABLE 2 for Question 3(a) and 3(b) in the Diagram Booklet. Complete TABLE 2 by:

- (a) Stating the name of the labelled muscles.**
- (b) Stating the role of the labelled muscles.**

Muscles are classified as either voluntary, involuntary or cardiac.

- (c) Explain, using an example, why the characteristics of CARDIAC muscle are important to a sports performer.
(3 marks)**

Answer space continues on the next page.

3(c) continued.

(Total for Question 3 = 7 marks)

- 4 Look at FIGURE 3 for Question 4 in the Diagram Booklet. It shows a performer during a training session. Her left hip and left knee are circled.**

Analyse the actions of the antagonistic muscle pairs at the CIRCLED joints of the left HIP and left KNEE that cause the movement from POSITION A to POSITION B in FIGURE 3.

- (i) Left hip
(3 marks)**

Answer space continues on the next page.

4(i) continued.

**(ii) Left knee
(3 marks)**

Answer space continues on the next page.

4(ii) continued.

(Total for Question 4 = 6 marks)

5 Look at TABLE 3 for Question 5 in the Diagram Booklet. It lists some common techniques and skills used in different sporting activities and places them into two different groups.

(i) State the MUSCLE FIBRE TYPE most beneficial to all three activities listed in GROUP 1.

(1 mark)

(ii) State the MUSCLE FIBRE TYPE most beneficial to all three activities listed in GROUP 2.

(1 mark)

(Total for Question 5 = 2 marks)

6 Look at FIGURE 4 for Question 6 in the Diagram Booklet. It shows a simplified diagram of the heart.

(a) Identify the structure labelled **A in FIGURE 4.
(1 mark)**

(b) State the function of the structure labelled **A in
FIGURE 4.
(1 mark)**

(Total for Question 6 = 2 marks)

7 Two functions of the cardiovascular system are transport of nutrients and clotting of open wounds.

**(a) State ONE OTHER function of the cardiovascular system that is important to a sports performer during physical activity.
(1 mark)**

(continued on the next page)

7 continued.

- (b) Explain why the clotting of open wounds is an important function if a person is injured during physical activity.
(2 marks)**

(Total for Question 7 = 3 marks)

8 Look at FIGURE 5 for Question 8(a) in the Diagram Booklet. It shows a sketch of a lever system.

(a) Identify the components of the lever system, A, B and C, in FIGURE 5.

(i) A
(1 mark)

(ii) B
(1 mark)

(iii) C
(1 mark)

(continued on the next page)

8 continued.

Look at FIGURE 6 for Question 8(b) in the Diagram Booklet. It shows a trampolinist mid routine.

To get the required height, the trampolinist pushes down on the trampoline each time she lands.

(b) State the name of the LEVER SYSTEM acting at the ANKLE when the trampolinist pushes off the trampoline.

(1 mark)

(continued on the next page)

8 continued.

The lever system used to push off the trampoline provides a mechanical advantage.

**(c) Explain the MECHANICAL ADVANTAGE for the performer as she pushes off the trampoline.
(2 marks)**

(continued on the next page)

Turn over

8 continued.

The trampolinist performs a piked front somersault as part of her routine.

(d) Identify the plane and axis when performing a piked front somersault.

**(i) Plane
(1 mark)**

**(ii) Axis
(1 mark)**

(Total for Question 8 = 8 marks)

TOTAL FOR SECTION A = 40 MARKS

Turn over

Write your answers in the spaces provided.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

SECTION B

Physical Training

- 9 Look at TABLE 4 for Question 9(a) and 9(b) in the Diagram Booklet. It shows part of an athlete's training programme.**

(a) Which ONE of the following principles of training is the athlete applying to their training?

(1 mark)

- ☐ **A Individual needs**
- ☐ **B Progressive overload**
- ☐ **C Reversibility**
- ☐ **D Thresholds of training**

(continued on the next page)

9 continued.

(b) Which ONE of the following indicates the application of the FITT principle INTENSITY? (1 mark)

- ☐ **A Complete a long-distance run**
- ☐ **B Train 3 times each week**
- ☐ **C Train for 60 minutes**
- ☐ **D Use body weight as resistance**

Look at FIGURE 7 for Question 9(c) in the Diagram Booklet. It shows a performer during an exercise session.

(c) Which ONE of the following training methods is being used by the performer in FIGURE 7? (1 mark)

- ☐ **A Aerobics**
- ☐ **B Fartlek**
- ☐ **C Pilates**
- ☐ **D Resistance**

(continued on the next page)

Turn over

9 continued.

Look at TABLE 5 for Question 9(d) in the Diagram Booklet. It shows ratings for the sit and reach test for adults.

**(d) Which ONE of the following is the correct rating for a male, who scored 12 in the sit and reach test?
(1 mark)**

- ☐ **A Excellent**
- ☐ **B Very good**
- ☐ **C Average**
- ☐ **D Fair**

(Total for Question 9 = 4 marks)

- 10 Carlton is an endurance athlete. Carlton's training leads to a drop in his resting heart rate and an increase in the strength of his diaphragm.**

Explain why these long-term training effects are an advantage for an endurance athlete.

- (i) Drop in resting heart rate
(2 marks)**

(continued on the next page)

10 continued.

**(ii) Increase in strength of diaphragm
(2 marks)**

(Total for Question 10 = 4 marks)

- 11 George is returning to badminton training after recovering from a long illness.**

Look at FIGURE 8 for Question 11(a) in the Diagram Booklet. It shows a relationship between performance, health, exercise and fitness.

- (a) Justify, using FIGURE 8, why George's badminton performance will be lower after his long break from playing.
(3 marks)**

Answer space continues on the next page.

11(a) continued.

(continued on the next page)

11 continued.

- (b) Explain ONE reason why George retests his fitness BEFORE he starts training again after his illness.
(2 marks)**

(continued on the next page)

11 continued.

Look at TABLE 6 for Question 11(c) in the Diagram Booklet. It shows two fitness tests George carries out.

- (c) (i) State ONE OTHER fitness test George could use to test his CARDIOVASCULAR FITNESS.
(1 mark)**

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11(c) continued.

(ii) Explain which ONE of the fitness tests in TABLE 6 is LESS appropriate to measure George's badminton fitness.
(3 marks)

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11 continued.

- (d) Describe the test protocol for the Cooper 12-minute run.
(3 marks)**

(Total for Question 11 = 12 marks)

Turn over

12 A basketball coach carries out some fitness tests.

Look at TABLE 7 for Question 12(a) and 12(b) in the Diagram Booklet. Complete TABLE 7 by:

- (a) Stating the name of the component of fitness being tested.**
- (b) Stating how the component of fitness is used in basketball.**
- (c) Look at TABLE 8 for Question 12(c) in the Diagram Booklet. It shows the ratings of four basketball players' fitness tests.**
 - (i) State which player in TABLE 8 has the highest rating for power.
(1 mark)**

(continued on the next page)

12(c) continued.

- (ii) Justify, using the ratings in TABLE 8, why the coach would select Player 3 for the basketball team.
(2 marks)**

(Total for Question 12 = 7 marks)

- 13 Some athletes take performance-enhancing drugs (PEDs) to increase their performance.**

Explain ONE ADVANTAGE and ONE DISADVANTAGE of growth hormones (GH) for a **100 m SPRINTER competing in a major competition.**

- (i) Advantage
(2 marks)**

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13 continued.

**(ii) Disadvantage
(2 marks)**

(Total for Question 13 = 4 marks)

TOTAL FOR SECTION B = 31 MARKS

SECTION C

Extended writing question

- 14** Olivia plays football. She requires high levels of strength, cardiovascular fitness and agility for her playing position.

She trains regularly, using Fartlek training, circuit training and weight training.

**Evaluate the importance of these THREE methods of training in improving Olivia's fitness for football.
(9 marks)**

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(Total for Question 14 = 9 marks)

TOTAL FOR SECTION C = 9 MARKS

TOTAL FOR PAPER = 80 MARKS

END OF PAPER