

Physical Education
COMPONENT 1: Fitness and
Body Systems

Total Marks

Wednesday 17 May 2023 – 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.

Turn over

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.

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 is an example of a pivot joint?
(1 mark)**

☐ **A Hip**

☐ **B Knee**

☐ **C Neck (atlas and axis)**

☐ **D Shoulder**

(continued on the next page)

1 continued.

**(b) Which ONE of the following is the role of a ligament?
(1 mark)**

- ☐ **A To join blood vessel to blood vessel**
- ☐ **B To join bone to bone**
- ☐ **C To join bone to muscle**
- ☐ **D To join muscle to muscle**

(continued on the next page)

1 continued.

**(c) Which ONE of the following
is an example of an
INVOLUNTARY muscle?
(1 mark)**

- ☐ **A The biceps**
- ☐ **B The hip flexors**
- ☐ **C The muscular wall of an artery
or vein**
- ☐ **D The outer layer surrounding
the lungs**

(continued on the next page)

1 continued.

Look at FIGURE 1 for Question 1(d) in the Diagram Booklet. It shows a gymnast performing a tucked somersault.

**(d) Which ONE of the following is the correct plane and axis for the movement in FIGURE 1?
(1 mark)**

- ☐ **A Frontal plane about the sagittal axis**
- ☐ **B Sagittal plane about the frontal axis**
- ☐ **C Transverse plane about the sagittal axis**
- ☐ **D Transverse plane about the vertical axis**

(Total for Question 1 = 4 marks)

Turn over

- 2 Look at FIGURE 2 and TABLE 1 for Question 2 in the Diagram Booklet. It shows the bones of the knee and hand.**

Complete TABLE 1 in the Diagram Booklet by:

- (a) Identifying the bones labelled A and B in FIGURE 2.
(2 marks)**
- (b) Stating a DIFFERENT FUNCTION of each bone type.
(2 marks)**
- (c) Giving an example of the use of each bone's function in sport or physical activity.
(2 marks)**

(Total for Question 2 = 6 marks)

- 3 Complete the following statements about the classification of bones. (5 marks)**

(i) The ribs are examples of

bones. The ribs provide protection for the

For example, in boxing they will protect the boxer if

(continued on the next page)

3 continued.

(ii) The bones of the vertebra are called

bones. One function of this type of bone is

(Total for Question 3 = 5 marks)

- 4 Look at FIGURE 3 for Question 4 in the Diagram Booklet. It shows a gymnast.**

Analyse the action of the antagonistic muscle pairs at the ELBOW and ANKLE that result in the gymnast achieving the shape in FIGURE 3.

- (i) Elbow
(3 marks)**

Answer lines continue on the next page.

4(i) continued.

**(ii) Ankle
(3 marks)**

Answer lines continue on the next page.

Turn over

4(ii) continued.

(Total for Question 4 = 6 marks)

- 5 Muscles fibre types have different characteristics. Each fibre type is suited to the requirements of different sporting activities.**

Look at TABLE 2 for Question 5 in the Diagram Booklet. Complete TABLE 2 by:

- (a) Identifying each muscle fibre type from its characteristic or example of its use.
(2 marks)**
- (b) Stating a RELEVANT characteristic of the fibre type in ROW A.
(1 mark)**
- (c) Giving an example of when the fibre type in ROW B would be used in sport or physical activity.
(1 mark)**

(Total for Question 5 = 4 marks)

6 Amari takes part in long-distance events.

Explain the importance of white blood cells and blood plasma when training for a long-distance event.

**(i) White blood cells
(3 marks)**

Answer lines continue on the next page.

6(i) continued.

**(ii) Blood plasma
(3 marks)**

Answer lines continue on the next page.

Turn over

6(ii) continued.

(Total for Question 6 = 6 marks)

7 Look at FIGURE 4 for Question 7 in the Diagram Booklet. It shows an incomplete diagram of a lever system.

**(a) (i) Identify the lever system shown in FIGURE 4.
(1 mark)**

**(ii) Identify the TWO missing parts of the lever system, labelled X and Y, in FIGURE 4.
(2 marks)**

X _____

Y _____

(continued on the next page)

7 continued.

**(b) Explain why the lever system in
FIGURE 4 gives a MECHANICAL
ADVANTAGE to a performer.
(2 marks)**

(continued on the next page)

Turn over

7 continued.

- (c) Give ONE example of the use of the type of lever system shown in FIGURE 4 in sport or physical activity.
(1 mark)**

(Total for Question 7 = 6 marks)

8 Look at FIGURE 5 for Question 8 in the Diagram Booklet. It shows two football players completing different skills during a game.

**(a) Complete the following statements about the lever systems.
(2 marks)**

(i) The lever system operating at the footballer's ELBOW as the player throws the ball on to the pitch is an example of a

class lever system.

(continued on the next page)

8(a) continued.

(ii) The lever system operating at the footballer's KNEE as the player kicks the ball at the goal is an example of a

class lever system.

(continued on the next page)

8 continued.

- (b) Identify the LOAD in the lever system in FIGURE 5 during the THROW-IN.
(1 mark)**

(Total for Question 8 = 3 marks)

TOTAL FOR SECTION A = 40 MARKS

Turn over

SECTION B

Indicate which question you are answering by marking a cross in the box ☐. If you change your mind, put a line through the box ☒ and then indicate your new question with a cross ☐.

Physical training

9 Look at FIGURE 6 for Question 9 in the Diagram Booklet. It shows the heart rate of a runner during a training session.

(a) Which ONE of the following training methods is the runner **MOST LIKELY** to be using in the training session?
(1 mark)

☐ A Continuous

☐ B Fartlek

☐ C Interval

☐ D Plyometrics

(continued on the next page)

Turn over

9 continued.

**(b) Which ONE of the following training methods can be used to increase strength AND muscular endurance?
(1 mark)**

- ☐ **A Fartlek**
- ☐ **B Interval**
- ☐ **C Plyometrics**
- ☐ **D Weight**

(continued on the next page)

9 continued.

**(c) Which ONE of the following is a long-term training effect on the RESPIRATORY system?
(1 mark)**

- ☐ **A Drop in resting blood pressure**
- ☐ **B Increased maximum cardiac output**
- ☐ **C Increased resting stroke volume**
- ☐ **D Increased vital capacity**

(continued on the next page)

9 continued.

**(d) Which ONE of the following principles of training can result from poor planning?
(1 mark)**

- ☐ **A FITT**
- ☐ **B Overtraining**
- ☐ **C Progressive overload**
- ☐ **D Thresholds of training**

(Total for Question 9 = 4 marks)

10 Carron is training to take part in a long-distance cycle race.

Look at TABLE 3 for Question 10 in the Diagram Booklet. It shows data collected during one of Carron's training sessions.

(a) Justify, using the data in TABLE 3, why part 2 of the training session was the most demanding for Carron. (3 marks)

Answer lines continue on the next page.

10(a) continued.

(continued on the next page)

10 continued.

(b) Carron's training causes adaptations to her muscular-skeletal system.

**(i) State ONE long-term training effect on Carron's MUSCULAR system.
(1 mark)**

(continued on the next page)

10(b) continued.

- (ii) State ONE long-term training effect on Carron's SKELETAL system.
(1 mark)**

(continued on the next page)

10 continued.

Carron needs high levels of muscular endurance to complete her long-distance cycle race. She carries out the one-minute sit-up test to measure her muscular endurance.

- (c) Explain whether the one-minute sit-up test is an appropriate fitness test to measure Carron's muscular endurance.
(2 marks)**

Answer lines continue on the next page.

Turn over

10(c) continued.

(Total for Question 10 = 7 marks)

11 Mark wants to increase his fitness.

- (a) Explain ONE reason why Mark should measure his fitness BEFORE designing a personal exercise programme (PEP).
(2 marks)**

(continued on the next page)

Turn over

11 continued.

Mark uses the grip dynamometer test to measure his strength.

**(b) Describe how to complete the grip dynamometer test.
(2 marks)**

(continued on the next page)

Turn over

11 continued.

Look at TABLE 4 for Question 11(c) in the Diagram Booklet. It shows ratings for the grip dynamometer test.

**(c) State Mark's rating if he scores 48 on the grip dynamometer test.
(1 mark)**

(continued on the next page)

11 continued.

Mark carries out some more fitness tests.

**Look at TABLE 5 for Questions 11(d) and 11(e) in the Diagram Booklet.
Complete TABLE 5 by:**

**(d) Stating the component of fitness Mark is testing.
(2 marks)**

**(e) Stating a method of training or fitness class Mark should use to improve the component of fitness being tested.
(2 marks)**

(continued on the next page)

11 continued.

- (f) Explain why the fitness class BODY PUMP would be a good choice to increase Mark's strength.
(2 marks)**

(continued on the next page)

11 continued.

Mark joins a circuit training class to increase his fitness.

Look at FIGURE 7 for Question 11(g) in the Diagram Booklet. It shows the circuit.

- (g) (i) State, using an example, how Mark could apply PROGRESSIVE OVERLOAD to the sit-up station. (2 marks)**

Answer lines continue on the next page.

Turn over

11(g)(i) continued.

(continued on the next page)

11(g) continued.

- (ii) State, using an example, how Mark could apply SPECIFICITY to the circuit if his aim is to increase strength.
(2 marks)**

(Total for Question 11 = 15 marks)

Turn over

12 Jacob strains a muscle during a cross-country run. His teacher suggests Jacob treats the injury using RICE.

(a) State the meaning of the first-aid term RICE.

(1 mark)

(b) Give ONE example of an activity that Jacob could complete as part of his warm-up to reduce the risk of a muscle strain.

(1 mark)

12 continued.

Some elite athletes take performance-enhancing drugs (PEDs) so they can continue to train and perform when injured.

**(c) Explain ONE type of performance-enhancing drug (PED) an injured sports performer may take before competition to allow them to perform.
(2 marks)**

Answer lines continue on the next page.

Turn over

12(c) continued.

(continued on the next page)

12 continued.

- (d) State the type of performance-enhancing drug (PED) that masks the presence of other drugs.
(1 mark)**
-
-

(Total for Question 12 = 5 marks)

TOTAL FOR SECTION B = 31 MARKS

Turn over

SECTION C

Extended writing question

13 Tom's football team is playing in the regional finals in three weeks. It is important that the team continues to play and train but remains injury free.

Evaluate THREE DIFFERENT WAYS, apart from warming up, the team can reduce the risk of injury so the team can play in the final.

(9 marks)

Answer lines continue on the next 5 pages.

Turn over

13 continued.

Turn over

13 continued.

Turn over

13 continued.

Turn over

13 continued.

Turn over

13 continued.

(Total for Question 13 = 9 marks)

TOTAL FOR SECTION C = 9 MARKS

TOTAL FOR PAPER = 80 MARKS

END OF PAPER