

Physical Education
COMPONENT 1: Fitness and
Body Systems

Total Marks

Time: 1 hour 45 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.

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 90.

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 ☐.

(continued on the next page)

- 1 Look at FIGURE 1 for Question 1(a) in the Diagram Booklet. It shows part of the structure of the skeletal system.**

**(a) Which ONE of the following is the name of the bone labelled X in FIGURE 1?
(1 mark)**

- ☐ **A Carpal**
- ☐ **B Cervical**
- ☐ **C Clavicle**
- ☐ **D Cranium**

(continued on the next page)

1 continued.

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

- ☐ **A Tendons join bone to bone**
- ☐ **B Tendons join ligaments to bone**
- ☐ **C Tendons join muscle to bone**
- ☐ **D Tendons join muscle to muscle**

(continued on the next page)

1 continued.

**(c) Which ONE of the following muscles contracts to bring about EXTENSION at the HIP?
(1 mark)**

- ☐ **A Biceps**
- ☐ **B Gluteus maximus**
- ☐ **C Latissimus dorsi**
- ☐ **D Quadriceps**

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1 continued.

**(d) Which ONE of the following
is a characteristic of TYPE IIX
muscle fibres?
(1 mark)**

- ☐ **A They are very fatigue resistant**
- ☐ **B They have a large
capillary network**
- ☐ **C They produce a large amount
of force**
- ☐ **D They work aerobically**

(continued on the next page)

1 continued.

Look at Table 1 for Question 1(e) in the Diagram Booklet. It shows ratings for the grip dynamometer test for teenagers aged 16 to 19.

**(e) Which ONE of the following is the correct rating for a female, who scored 32 in the grip dynamometer test?
(1 mark)**

☐ **A Excellent**

☐ **B Good**

☐ **C Average**

☐ **D Fair**

(continued on the next page)

Turn over

1 continued.

Look at FIGURE 2 for Question 1(f) in the Diagram Booklet. It shows an individual's resting blood pressure as blood travels through the different types of blood vessels in the body.

**(f) Which ONE of the following, A, B, C or D represents the blood pressure as the blood leaves the heart?
(1 mark)**

☐ **A**

☐ **B**

☐ **C**

☐ **D**

(continued on the next page)

Turn over

1 continued.

**(g) Which ONE of the following terms means the amount of blood leaving the heart per minute?
(1 mark)**

☐ **A Cardiac output**

☐ **B Stroke volume**

☐ **C Tidal volume**

☐ **D Vital capacity**

(continued on the next page)

Turn over

1 continued.

**(h) Which ONE of the following, A, B, C or D, shows the correct movement of gases into and out of the alveoli during gaseous exchange?
(1 mark)**

☐ **A O₂ out, CO₂ out**

☐ **B O₂ in, CO₂ in**

☐ **C O₂ out, CO₂ in**

☐ **D O₂ in, CO₂ out**

(Total for Question 1 = 8 marks)

- 2 Look at FIGURE 4 for Question 2(a) and Question 2(b) in the Diagram Booklet. It shows the muscular system.**

Complete TABLE 2 in the Diagram Booklet by:

**(a) Stating the name of the labelled muscles.
(2 marks)**

**(b) Stating the function of the labelled muscles.
(2 marks)**

(continued on the next page)

2 continued.

**(c) State ONE reason why skeletal muscles are classified as VOLUNTARY muscles.
(1 mark)**

(continued on the next page)

2 continued.

**(d) Explain, using an example,
why INVOLUNTARY muscles
are important during sport and
physical activity.
(3 marks)**

(continued on the next page)

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2 continued.

(Total for Question 2 = 8 marks)

Turn over

3 Games players constantly change direction when playing their sport.

(a) (i) State the component of fitness games players use to quickly change direction.

(1 mark)

(ii) State the name of the fitness test that measures how quickly you can change direction.

(1 mark)

(continued on the next page)

3 continued.

**(b) Explain why the role of ligaments is important to games players.
(2 marks)**

(continued on the next page)

Turn over

3 continued.

One of the functions of the cardiovascular system is to help regulate body temperature.

**(c) Explain why the cardiovascular system needs to regulate a games player's body temperature when they play sport.
(4 marks)**

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3 continued.

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3 continued.

(continued on the next page)

3 continued.

(d) Games players work aerobically and anaerobically during a game.

**(i) Give ONE example of a games player working AEROBICALLY in their sport.
(1 mark)**

(continued on the next page)

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3 continued.

**(ii) Give ONE example of a
games player working
ANAEROBICALLY in their sport.
(1 mark)**

(continued on the next page)

3 continued.

**(e) State ONE of the by-products of
AEROBIC energy production.
(1 mark)**

(Total for Question 3 = 11 marks)

4 Look at FIGURE 5 for Question 4 in the Diagram Booklet. It shows a gymnast during their performance of a cartwheel.

(a) State the plane and axis used in FIGURE 5 to perform this movement. (2 marks)

Plane

Axis

(continued on the next page)

4 continued.

**(b) State the antagonistic muscle pair acting at the elbow that allow the gymnast to extend the arm at the elbow during the cartwheel.
(2 marks)**

Agonist

Antagonist

(continued on the next page)

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4 continued.

**(c) State the classification of the joint at the hip.
(1 mark)**

**(d) State the type of movement that has occurred at the gymnast's hip joints to achieve the position shown in FIGURE 5.
(1 mark)**

(continued on the next page)

4 continued.

- (e) Explain the importance of the short bones in the gymnast's wrists during the movement shown in FIGURE 5. (2 marks)**

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4 continued.

**(f) Describe the RANGE of movement possible at condyloid joints.
(3 marks)**

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4 continued.

(Total for Question 4 = 11 marks)

- 5 Look at FIGURE 6 for Question 5 in the Diagram Booklet. It shows a footballer kicking a football. His right knee and right ankle are circled.**

Analyse the action of the antagonistic muscle pairs at the CIRCLED joints of the right KNEE and right ANKLE that causes the movement from Position A to Position B in FIGURE 6.

(begin your answer on the next page)

5 continued.

**Knee
(3 marks)**

(continued on the next page)

Turn over

5 continued.

(continued on the next page)

5 continued.

**Ankle
(3 marks)**

(continued on the next page)

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5 continued.

(Total for Question 5 = 6 marks)

6 There are three types of health.

(a) State the type of health missing from this definition:

**Health is a state of complete physical and social well-being, and not merely the absence of disease and infirmity.
(1 mark)**

(continued on the next page)

6 continued.

Health, fitness, exercise and performance affect each other because of the relationships between them.

**(b) (i) State ONE relationship between exercise and performance.
(1 mark)**

(continued on the next page)

Turn over

6 continued.

(continued on the next page)

6 continued.

(ii) State ONE relationship between any TWO of the following:

- **Health**
- **Fitness**
- **Exercise**

(1 mark)

(continued on the next page)

Turn over

6 continued.

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6 continued.

An individual's fitness can be improved through the application of the principles of training.

Look at FIGURE 7 for Question 6 in the Diagram Booklet. It gives an outline of an individual's training programme.

Complete TABLE 3 in the Diagram Booklet by:

(c) Giving ONE example of how each of the principles of training could be applied to the training programme in FIGURE 7.

**Use a DIFFERENT example for each principle.
(2 marks)**

(continued on the next page)

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6 continued.

Regular training causes long-term training effects.

**(d) Explain the benefit of ONE long-term training effect on the CARDIOVASCULAR system for a long-distance runner.
(3 marks)**

(continued on the next page)

Turn over

6 continued.

(Total for Question 6 = 8 marks)

- 7 An athletics coach uses fitness test results to select the athletics team.**

Look at TABLE 4 for Question 7 in the Diagram Booklet. It shows the fitness test results for four athletes.

- (a) State which athlete in TABLE 4 has the highest rating for speed.
(1 mark)**

(continued on the next page)

7 continued.

**(b) Justify, using the ratings in TABLE 4, why the coach would select Athlete 1 for the 110m hurdling event.
(2 marks)**

(continued on the next page)

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7 continued.

The 3000m is a long-distance running event.

**(c) Justify, using the ratings in TABLE 4, which athlete would MOST LIKELY be chosen to run the 3000m.
(3 marks)**

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Turn over

7 continued.

(Total for Question 7 = 6 marks)

- 8 Look at FIGURE 8 for Question 8 in the Diagram Booklet. Explain why the diver in FIGURE 8 could suffer a concussion.**

(Total for Question 8 = 2 marks)

- 9 Some athletes take performance-enhancing drugs to improve their performance.**

Complete TABLE 5 in the Diagram Booklet by:

- (a) Stating the name of the type of performance-enhancing drug from the description of its effect.
(2 marks)**

(continued on the next page)

9 continued.

**(b) State the meaning of the term
blood doping.
(1 mark)**

(continued on the next page)

9 continued.

**(c) Give ONE example of a sport or activity where blood doping may occur.
(1 mark)**

(Total for Question 9 = 4 marks)

10 Look at TABLE 6 for Question 10 in the Diagram Booklet. It shows the different fitness tests carried out by a 10,000m runner and a shot putter.

**(a) State the component of fitness tested by BOTH performers.
(1 mark)**

(continued on the next page)

10 continued.

The 10,000m runner carries out the sit and reach test.

**(b) Describe how to carry out the sit and reach test.
(3 marks)**

(continued on the next page)

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10 continued.

**(c) Explain ONE reason why a shot putter would use the vertical jump test.
(2 marks)**

(continued on the next page)

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10 continued.

- (d) Justify why the shot putter should change the Cooper 12-minute swim for another fitness test.
(2 marks)**

(Total for Question 10 = 8 marks)

Turn over

- 11 Christina plays handball. Each match lasts 60 minutes.**

Look at TABLE 7 for Question 11 in the Diagram Booklet. It shows three short-term effects of playing handball on Christina's body systems.

**Evaluate the importance of the three short-term effects listed in TABLE 7 on Christina's handball PERFORMANCE.
(9 marks)**

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(Total for Question 11 = 9 marks)

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12 Mason is a sprinter. Sprinters require high levels of power, speed and reaction time to perform well in their event.

Mason trains regularly, using interval training, plyometric training and continuous training.

**Evaluate the importance of these THREE training methods in improving Mason's fitness to make him a better sprinter.
(9 marks)**

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12 continued.

(Total for Question 12 = 9 marks)

TOTAL FOR PAPER = 90 MARKS
END OF PAPER