PART I

Answer all questions

Questions 1 to 10 should be answered by writing A, B, C or D in the spaces provided.

1. Bones can be classified into different groups. The phalanges are an example of:

A. Long bones
B. Short bones
C. Irregular bones
D. Flat (plate) bones

(Total 1 mark)

2. Flexion is possible at hinge joints. Which of the following statements describes flexion at a joint?

A. The range of movement possible at a joint
B. The action of closing the angle between the bones making the joint
C. The action of increasing the angle between the bones making the joint
D. Increasing the size of the muscle

(Total 1 mark)

3. The main function of a tendon is to:

A. Stabilise a joint
B. Prevent back flow of blood
C. Join muscle to bone
D. Join muscle to muscle

(Total 1 mark)
4. The septum is found in the:
   A. Blood
   B. Lungs
   C. Brain
   D. Heart

   (Total 1 mark)

5. Which of the following is not a function of the nasal passages?
   A. Removal of carbon dioxide from the incoming air
   B. Filter out dust particles from the incoming air
   C. Warm the incoming air
   D. Moisten the incoming air

   (Total 1 mark)

6. Fitness is:
   A. The ability to fight off diseases
   B. The ability to meet the demands of the environment
   C. Training once a week
   D. Being muscular

   (Total 1 mark)

7. The definition of obesity is:
   A. The percentage of body weight which is fat, muscle and bone
   B. A term to describe someone who has weight in excess of normal
   C. A term to describe people who are very overfat
   D. A term to describe someone who is under-nourished

   (Total 1 mark)
8. Protein is an essential part of the diet. It is used to:
   A. Aid digestion
   B. Increase blood flow
   C. Transport oxygen
   D. Assist with growth and repair of cells

(Total 1 mark)

9. Ice packs or ice bags are often used in the immediate treatment of sports injuries. Which of the following injuries should be treated by using an ice pack or ice bag?
   A. Cuts/grazes
   B. Fractures
   C. Dislocations
   D. Soft tissue injuries

(Total 1 mark)

10. The letters D.R.A.B.C. are used to help first-aiders remember the actions to be taken when finding an unconscious casualty.

Which of the following statements best describes D.R.A.B.C?
   A. Dislocation, Resuscitation, Altitude, Blood, Cardiac
   B. Danger, Respiration, Airway, Blood, Circulation
   C. Danger, Recovery Position, Airway, Breathing, Cardiac
   D. Danger, Response, Airway, Breathing, Circulation

(Total 1 mark)

TOTAL FOR PART ONE: 10 MARKS
11. This question relates to the growth, development and composition of bone.

(a) Using the words from the box below, complete the sentences, which describe the growth and development of bone.

OSSIFICATION  CARTILAGE  CALCIUM

(i) .................. is the process through which bone is formed.

(ii) Bone starts as.........................

(iii) ......................... makes the bone hard.

(b) Complete the following paragraph about the composition of long bones:

Long bones are made up of two types of bone tissue. ......................... bone is a very tough material that forms the ......................... of the bone. The other type of bone tissue is ......................... bone. This is found inside the head of a long bone.

12. Blood production is one function of the skeleton. In which part of the bone does this take place?
13. Figure 1 is a diagram of the human skeleton.

Give the anatomical name for the bones labelled:

A ..............................................

B ..............................................

C ..............................................

D ..............................................

E ..............................................

(Total: 5 marks)
14. Figure 2 is a diagram of the knee joint.

(a) State a function of each of the labelled parts:

<table>
<thead>
<tr>
<th>Labelled Part</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Bone</td>
<td></td>
</tr>
<tr>
<td>B. Cartilage</td>
<td></td>
</tr>
<tr>
<td>C. Synovial Membrane</td>
<td></td>
</tr>
<tr>
<td>D. Joint Capsule</td>
<td></td>
</tr>
<tr>
<td>E. Synovial fluid</td>
<td></td>
</tr>
</tbody>
</table>

(b) (i) What type of joint is the knee joint?

(ii) Give another example of this type of joint.

(c) Flexion and extension are the main movement possibilities at the knee joint. State one other type of movement and name a joint where this movement is possible.

(i) Movement

(ii) Joint

(Total: 9 marks)
15. Figure 3 is a diagram of the human muscular system.

(a) Name the muscles labelled and state the main function for each

<table>
<thead>
<tr>
<th>Muscle</th>
<th>Main Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td></td>
</tr>
<tr>
<td>B.</td>
<td></td>
</tr>
<tr>
<td>C.</td>
<td></td>
</tr>
<tr>
<td>D.</td>
<td></td>
</tr>
<tr>
<td>E.</td>
<td></td>
</tr>
</tbody>
</table>

(Total: 10 marks)
16. Muscles can be classified as one of three different TYPES. Complete the table below by giving an example of a muscle for each of the stated types.

<table>
<thead>
<tr>
<th>MUSCLE TYPE</th>
<th>EXAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLUNTARY</td>
<td></td>
</tr>
<tr>
<td>CARDIAC</td>
<td></td>
</tr>
<tr>
<td>INVOLUNTARY</td>
<td></td>
</tr>
</tbody>
</table>

(Total: 3 marks)

17. Skeletal muscles have both fast and slow twitch muscle fibres. Explain why skeletal muscles have these two different types of muscle fibre.

(Total: 2 marks)

18. Use the words from the box below to complete the paragraph about ligaments:

BONE  ELASTICITY
STABILISE  FEED  RANGE
CARTILAGE  MUSCLE

Ligaments join ......................... to bone. They .................... the joint, preventing unwanted movement. They have some ...................... The position of the ligaments across a joint determines the ...................... of movement at the joint.

(Total: 4 marks)
19. Figure 4 is a diagram of a vertical section of the human heart.

Explain the function of the parts labelled:

A: ..............................................................

B: ..............................................................

C: ..............................................................

D: ..............................................................

E: ..............................................................

(Total: 5 marks)
20. Heart rate is the number of times the heart beats per minute.

(i) Tick the box which describes what happens to a performer’s heart rate immediately they begin to exercise.

- drops □
- remains the same □
- increases □  

(1)

(ii) Give one reason for your answer.

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

(1)

(Total: 2 marks)

21. There are three main types of blood vessel.

(a) Name each type of blood vessel and describe its function.

<table>
<thead>
<tr>
<th>Type</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(3)

(b) Which type of blood vessel contains valves?

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

(1)

(Total: 4 marks)
22. Figure 5 is a diagram of the human respiratory system.

Give the **anatomical** name of the parts labelled:

A: ..............................................................

B: ..............................................................

C: ................................................................

(Total: 3 marks)
23. What does the following sentence define?

The amount of oxygen consumed during recovery above that which would have ordinarily been consumed at rest in the same time. (This results in a shortfall in the oxygen available).

(Total: 1 mark)

24. Explain the following terms:

(i) Vital Capacity:

(1)

(ii) Tidal Volume:

(1)

(Total: 2 marks)

25. The following question relates to the production of lactic acid and its effects.

(a) Why is lactic acid produced?

(1)

(b) What happens as lactic acid builds up in the muscles?

(1)

(c) Give a specific example within a sport that would result in lactic acid production.

(1)
(d) Tick the box to indicate when, during a 3000m race, a professional athlete is most likely to accumulate the largest quantities of lactic acid?

☐ at a constant pace  ☐ during a sprint finish  ☐ after the race

(1)

(e) How will a professional athlete aid lactic acid removal from the body after the 3000m race?

(1)

(Total: 5 marks)

26. Define the term ‘exercise’.

(Total: 1 mark)

27. State three possible reasons why someone may decide to take part in sport.

(i)

(ii)

(iii)

(Total: 3 marks)
28. **Muscular strength** and **muscular endurance** are components of health-related exercise.

(a) Explain the meaning of each.

(i) Muscular strength: .................................................................

(1)

(ii) Muscular endurance: ..........................................................

(1)

(b) In the table below, give an activity and explain why the component is important in that activity.

<table>
<thead>
<tr>
<th>Component</th>
<th>Activity</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muscular strength</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muscular endurance</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Total: 4 marks)
29. The cardiovascular system is made up of three components.

   (a) State the missing component.

   HEART, BLOOD, ............................................................

   (1)

   (b) What is meant by “cardiovascular fitness”?

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

   (1)

   (c) Give two functions of the cardiovascular system during long periods of exercise.

   (i) ...........................................................................................................

   (ii) .........................................................................................................

   (2) Q29

   ~ (Total: 4 marks)
30. The following are components of skill-related fitness:

AGILITY  BALANCE  REACTION TIME  SPEED

(a) For the skill-related fitness components listed, state two practical activities in which the component is important, and describe how it is effective in each of the activities you give.

An example is given below:

<table>
<thead>
<tr>
<th>Component – Agility</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity 1 Gymnastics</td>
<td>Gymnasts use agility to control their whole body in a tumbling routine to improve their score.</td>
</tr>
<tr>
<td>Activity 2 Rugby</td>
<td>Rugby players use agility to suddenly change direction to get past an opponent.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component – Reaction Time</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity 1</td>
<td></td>
</tr>
<tr>
<td>Activity 2</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component – Balance</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity 1</td>
<td></td>
</tr>
<tr>
<td>Activity 2</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component – Speed</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity 1</td>
<td></td>
</tr>
<tr>
<td>Activity 2</td>
<td></td>
</tr>
</tbody>
</table>
(b) State and explain **two other** components of skill-related fitness.

<table>
<thead>
<tr>
<th>Component</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
</tbody>
</table>

(Total: 10 marks)

31. Darryl has decided to take his cycling more seriously and is planning a training programme to improve his performance. As part of his training he goes to the gym.

(a) (i) Tick one of the following boxes to show which cardiovascular machine would be the **most appropriate** for him to use:

- [ ] Rowing Machine  
- [ ] Treadmill  
- [x] Exercise Bike  

(ii) Which **principle of training** does this relate to?

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

(i) ..................................................................................................................................................

(iii) Explain why this would be the most appropriate exercise machine to use.

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

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..............................................................................................................................................
(b) Darryl trains once a week and after some time notices an improvement in his level of fitness, which is shown in the graph below.

Fitness Level over Time

(c) (i) What would you expect to happen to his level of fitness if Darryl simply maintained the same programme?

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

(1)

(ii) Explain your answer.

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

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

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

(1)

(d) Progression and overload are two other important principles of training.

Give an explanation of each:

(i) Progression

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

(1)

(ii) Overload

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

(1)
(e) Darryl applies the principle of overload to his programme.

Using the F.I.T.T principle, explain three ways that he might achieve this:

(i) ............................................................................................................................................. (1)

(ii) .............................................................................................................................................. (1)

(iii) ............................................................................................................................................... (1)

(f) Darryl is very dedicated to his training and never misses his weekly sessions.

(i) Which principle of training is he following?

.................................................................................................................................................... (1)

(ii) Why is this important?

..................................................................................................................................................... (1)

(g) Darryl’s sister also trains for cycling and is fitter than he is. Why is it important that he does not use her training programme?

......................................................................................................................................................... (1)

(Total: 13 marks)
32. Figure 6 shows a sketch map of the surrounding area of a school.

Figure 6.

(a) (i) What training method would this area be ideal for?

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

(1)

(ii) Explain your answer ..............................................................................................................

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

(1)

(b) State one component of fitness that this training method would improve.

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

(1)

(c) Why is this training method appropriate for games players?

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

(1)
(d) State two long term effects that this type of training could have on the performer’s circulatory system.

(i) ................................................................. (1)

(ii) ................................................................. (1)

(Total: 6 marks)
33. Figure 7 shows the layout of a fitness circuit.

Shiraz is working on his general fitness and has decided to vary his method of training as much as possible. He is planning a fitness circuit, but has only included three activities so far. To complete the circuit Shiraz needs to add more activities.

(a) In the spaces below state three more activities for his fitness circuit:

(i) .................................................................

(ii) .................................................................

(iii) .................................................................

(3)

(b) Of the activities shown, two exercise the legs, whilst the other exercises the arms. Why have the leg exercises not been placed next to each other?

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

(1)

(c) What is the correct name for the places where you do each exercise in the circuit?

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

(1)
(d) Give the two main factors which would determine how long Shiraz should work at each activity.

(i) .................................................................

(ii) .................................................................

(2)

(e) During the circuit Shiraz works his muscles in different ways. For example, during the press ups his muscles work isometrically (whilst the arms are straight and he is holding his body weight) and isotonically (as the body lowers and the arms bend.)

Define the terms:

(i) Isometric muscle contraction: .................................................................

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

(ii) Isotonic muscle contraction: .................................................................

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

(2)

(f) If Shiraz wanted to change the circuit to a skills circuit how would the activities be different?

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

(1) Q33

(Total: 10 marks)
34. In order to maintain ‘peak performance’ athletes have to consider their diet as well as their training programme. Figure 8 shows the proportions of the different **food groups** that an athlete may eat.

![Diagram](image)

**Figure 8**

(a) Apart from water and protein, name the missing food groups from the diagram:

(i) .......................................................... .......................................................... .......................................................... .......................................................... ..........................................................

(ii) .......................................................... .......................................................... .......................................................... .......................................................... ..........................................................

(iii) .......................................................... .......................................................... .......................................................... .......................................................... ..........................................................

(iv) .......................................................... .......................................................... .......................................................... .......................................................... ..........................................................

(v) .......................................................... .......................................................... .......................................................... .......................................................... ..........................................................

(5)
(b) (i) What food group is represented by the largest segment in the diagram?

(ii) Why is this food group needed by the body?

(c) Different athletes will eat different amounts. State two reasons for this:

(i) .................................................................

(ii) .................................................................

(Total: 9 marks)

35. Figure 9 is a diagram of the somatotype triangle.

(a) Describe the following body types:

(i) Mesomorph .................................................

(ii) Endomorph ................................................
(b) Different body types can be advantageous in different sporting situations.

(i) Give an example of a sporting activity that is **normally** associated with performers with an **ectomorph** body type

(ii) Give a reason for your answer

(Total: 4 marks)

36. In the boxes below write the letter of the definition that matches the name given to each principle of training.

A - Exercising for one part of fitness

B - How long you exercise

C - More than normal exercise

D - Start slowly and increase the amount of exercise

E - How often you exercise

1 - OVERLOAD

2 - SPECIFICITY

3 - FREQUENCY

4 - DURATION

5 - PROGRESSION

(Total: 5 marks)
38. Figure 5 below shows heart rate figures for two different games players during the first 6 minutes of a training session. Minutes 7 to 11 were a rest period.

<table>
<thead>
<tr>
<th>PLAYER</th>
<th>Time in Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0   1   2   3</td>
</tr>
<tr>
<td></td>
<td>75  80  95 120</td>
</tr>
<tr>
<td>B</td>
<td>65  75  85 115</td>
</tr>
</tbody>
</table>

Figure 5

(a) Use the figures from the table to plot a graph to show the heart rate values.

<table>
<thead>
<tr>
<th>Heart Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>145</td>
</tr>
<tr>
<td>140</td>
</tr>
<tr>
<td>135</td>
</tr>
<tr>
<td>130</td>
</tr>
<tr>
<td>125</td>
</tr>
<tr>
<td>120</td>
</tr>
<tr>
<td>115</td>
</tr>
<tr>
<td>110</td>
</tr>
<tr>
<td>105</td>
</tr>
<tr>
<td>100</td>
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<tr>
<td>95</td>
</tr>
<tr>
<td>90</td>
</tr>
<tr>
<td>85</td>
</tr>
<tr>
<td>80</td>
</tr>
<tr>
<td>75</td>
</tr>
<tr>
<td>70</td>
</tr>
<tr>
<td>65</td>
</tr>
</tbody>
</table>

(b) Which player started to recover from exercise first? ........................................ (1)

(c) (i) Did player A fully recover by the 11th minute?

......................................................... (1)

(ii) Give a reason for your answer.

......................................................... (1)

(d) (i) Based on these figures, who appears to be the fitter player? .... (1)

(ii) Give a reason for your answer.

......................................................... (1)

(Total: 9 marks)