## PART I

**Answer all questions**

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

1. The main function of red blood cells is to:
   - A. Fight infection
   - B. Carry hormones
   - C. Assist with clotting
   - D. Carry oxygen

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

2. The vertebral column consists of the following regions:
   - A. Coccyx, lumbar, cervical, thoracic, sacrum
   - B. Pelvic, pectoral, thoracic, lumbar, sacrum
   - C. Sternum, scapula, sacrum, coccyx, pectoral
   - D. Coccyx, lumbar, clavicle, thorax, sacrum

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

3. Where in the body would you find the deltoid muscle?
   - A. Rear of lower leg
   - B. The shoulder
   - C. In-between the ribs
   - D. The ankles

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

4. The tricuspid valve of the heart is situated:
   - A. Between the right atrium and right ventricle
   - B. In the pulmonary vein
   - C. In the pulmonary artery
   - D. Between the left atrium and left ventricle

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

5. The respiratory system consists of the:
   - A. Alveoli, bronchioles, heart, lungs
   - B. Heart, blood vessels, blood, lungs
   - C. Alveoli, bronchi, heart, lungs
   - D. Alveoli, bronchioles, bronchi, lungs

   Answer.............................(1)
6. Which of the following equations best describes the process of aerobic respiration?
   
   A. glucose + oxygen + carbon dioxide $\Rightarrow$ energy + water
   B. glucose + carbon dioxide $\Rightarrow$ energy + oxygen + water
   C. glucose + oxygen $\Rightarrow$ carbon dioxide + water + energy
   D. glucose + water + carbon dioxide $\Rightarrow$ energy + oxygen

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

7. The hamstrings and quadriceps work antagonistically. This means that as one:

   A. contracts the other relaxes in order to move the limb
   B. contracts the other contracts as well to increase the force
   C. relaxes the other relaxes so that the muscle can rest
   D. contracts the other contracts in order to move the limb

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

8. Which of the following statements best describes the principle of specificity?

   A. Training that focuses on increasing all over body fitness
   B. Training that focuses on increasing strength in one particular area of the body
   C. Training that focuses on a gradual increase in work load
   D. Training that focuses on the particular requirements of the activity

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

9. Which of the following occurs as a **SHORT TERM IMMEDIATE** effect of exercise?

   A. Increase in heart rate
   B. Drop in resting heart rate
   C. Increase in speed of recovery
   D. Increase in muscle mass

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

10. R.I.C.E. represents four actions that should be followed in the event of a performer sustaining a sprain. Which of the following statements best describes R.I.C.E?

   A. Recovery, Ice, Compression, Elevation
   B. Rest, Ice, Compression, Elevation
   C. Rest, Inoculate, Compression, Elevation
   D. Recovery, Ice, Comfort, Elevation

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

   (Total: 10 marks)
PART II

Answer all questions

11. Complete the following paragraph about the growth and development of bone:

........................................is the name of the process by which bone is formed. The area

at which growth takes place in a bone is called..........................

The membrane/outer covering of the bone is called the..........................

(Total: 3 marks)

12. The human skeleton has several functions.

(a) One function is to protect vital organs. Complete the statement below by stating the name of a bone and the organ it protects:

The......................protects the.........................

(1)

(b) Another function of the skeleton is to assist with movement. Explain how the skeleton does this.

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

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

(1)

(Total: 2 marks)
13. The bones of the skeleton can be grouped according to their shape. Figure 1 shows three different bones which all belong to different groups.

![Figure 1](image.png)

(a) Name the group each bone belongs to:

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

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

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

(3)

(b) Complete the table by naming the bones in Figure 1 and state where in the body they are found:

<table>
<thead>
<tr>
<th>Label</th>
<th>NAME OF BONE</th>
<th>LOCATION IN BODY</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(6)

(Total: 9 marks)
14. Figure 2 is a side view of the knee joint.

![Figure 2]

(a) Give the names of the bones labelled:

A...........................................
B...........................................
C...........................................

(b) Which bone, normally associated with the knee joint, is not shown here?

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

(Total: 4 marks)

15. The table below refers to some of the components of a synovial joint and their functions. Complete the table:

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROTECTS ENDS OF BONES</td>
<td></td>
</tr>
<tr>
<td>SYNOVIAL FLUID</td>
<td>SURROUNDS THE JOINT</td>
</tr>
</tbody>
</table>

(Total: 3 marks)
16. Figure 3 shows a performer running.

![Figure 3](image)

(a) Complete the table below by naming each joint and joint type:

<table>
<thead>
<tr>
<th>Box Number</th>
<th>NAME OF JOINT</th>
<th>JOINT TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXAMPLE</td>
<td>ANKLE</td>
<td>HINGE</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(b) Which of these TYPES of joint allows the greatest range of movement?

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

(c) Where else in the body is this type of joint found?

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

(Total: 10 marks)
17. Figure 4 shows some of the movements possible at a selection of joints.

![Figure 4](image)

**A**

**B**

**C**

Figure 4

State the type of movement indicated by the arrows for each joint:

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

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

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

(Total: 3 marks)

18. Muscles can be classified as one of three different TYPES. Complete the table below by naming the correct muscle type.

<table>
<thead>
<tr>
<th>EXAMPLE</th>
<th>MUSCLE TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BICEPS</td>
<td></td>
</tr>
<tr>
<td>HEART</td>
<td></td>
</tr>
<tr>
<td>MUSCLE SURROUNDING THE BRONCHI</td>
<td></td>
</tr>
</tbody>
</table>

(Total: 3 marks)
19. Figure 5 is a diagram of the right arm in two different positions.

![Figure 5](image)

(a) Give the anatomical name for the muscles labelled:

A: .......................................................... (1)
B: .......................................................... (1)

(b) Which of these muscles must contract to move the arm from position I to II?

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

(c) The following table refers to muscles and the actions they bring about. Complete the table by naming the muscles which bring about the stated actions:

<table>
<thead>
<tr>
<th>NAME OF MUSCLE</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EXTENSION OF HIP</td>
</tr>
<tr>
<td></td>
<td>SHOULDER EXTENSION</td>
</tr>
<tr>
<td></td>
<td>EXTENSION OF KNEE</td>
</tr>
</tbody>
</table>

(Total: 6 marks)
20. Muscles have different types of fibres which are used for different types of activities. State the most appropriate fibre type for the following activities:

(a) Jogging .................................................. (1)

(b) Sprinting .................................................. (1)

(Total: 2 marks)

21. Explain the term ‘muscle tone’.

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

(Total: 1 mark)

22. Complete the statements about tendons and ligaments:

(a) ..............................join bone to bone. (1)

(b) ..............................are more elastic than. .............................................. (4)

(Total: 2 marks)
23. Figure 6 is a diagram of the heart.

![Heart Diagram]

**Figure 6**

(a) Name the parts labelled:

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

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

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

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

(b) (i) What is the function of the part labelled A?

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

(ii) Why is this so important?

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

(Total: 6 marks)
24. Cardiac output is the amount of blood ejected from the heart per minute.

(a) What happens to a person's cardiac output during exercise compared to when they are at rest?

Tick the correct answer box below.

Cardiac output during exercise:

- drops □
- increases □
- remains the same □  (1)

(b) Give a reason for your answer.

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

(Total: 2 marks)

25. Complete the following statements by using the words: 'arteries' OR 'veins':

(a) .........................work under low pressure.  (1)

(b) .........................take blood away from the heart.  (1)

(c) .........................have valves.  (1)

(Total: 3 marks)

26. Complete the following paragraph about the mechanism of breathing.

During inspiration the intercostal muscles contract to ....................... the ribs.

Meanwhile the diaphragm contracts, moving it ....................... Both of these movements ....................... the volume of the lungs.  (3)

<table>
<thead>
<tr>
<th></th>
<th>Raise</th>
<th>Lower</th>
<th>Downwards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreases</td>
<td></td>
<td></td>
<td>Increase</td>
</tr>
<tr>
<td>Inwards</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Total: 3 marks)
27. Figure 7 is a diagram of one alveolus in the lungs, exchanging gases with a blood vessel.

![Diagram of an alveolus and blood vessel](image)

**Figure 7**

(a) Name Gas 1.

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

(b) Name Gas 2.

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

(c) Gas 1 is transported to the alveoli by a very small blood vessel. What is the name of this TYPE of blood vessel?

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

(d) Gas 2 is transported to the alveoli through several ‘air passages’. Name the tube that brings this gas INTO the alveoli.

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

(Total: 4 marks)
28. The table below shows the relative composition of inhaled and exhaled air.

<table>
<thead>
<tr>
<th>GASES IN AIR</th>
<th>INHALED AIR</th>
<th>EXHALED AIR</th>
</tr>
</thead>
<tbody>
<tr>
<td>OXYGEN</td>
<td>21%</td>
<td>16%</td>
</tr>
<tr>
<td>CARBON DIOXIDE</td>
<td>0.04%</td>
<td>4%</td>
</tr>
</tbody>
</table>

(a) Why is there a decrease in the amount of oxygen exhaled compared to the amount inhaled?

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

(b) Why is there an increase in the amount of carbon dioxide exhaled compared to the amount inhaled?

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

(Total: 2 marks)

29. What terms are being defined?

The maximum amount of air you can breathe out after breathing as deeply as you can.

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

The amount of air breathed in or out per breath.

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

(Total: 2 marks)

30. There are many benefits of undertaking exercise. State three reasons, other than physical ones, why it might be an advantage to join a sports club.

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

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

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

(Total: 3 marks)
31. Define the following terms:

(a) Health .................................................................................................................................................. (1)

(b) Performance ............................................................................................................................................ (1)

(c) Give the correct term for 'a form of physical activity done primarily to improve one’s health and physical fitness'?

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

(Total: 3 marks)

32. The following table refers to components of health-related exercise and their definitions. Complete the table:

<table>
<thead>
<tr>
<th>COMPONENT OF HEALTH-RELATED FITNESS</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSCULAR STRENGTH</td>
<td>THE RANGE OF MOVEMENT OCCURRING AT A JOINT OR JOINTS WHEN MOVED</td>
</tr>
<tr>
<td>MUSCULAR ENDURANCE</td>
<td>RELATIVE AMOUNTS OF FAT, MUSCLE, BONE AND BODY FLUIDS</td>
</tr>
</tbody>
</table>

(Total: 4 marks)
33. The cardiovascular system plays a very important role during exercise.

(a) What do the two parts of the word refer to?

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

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

(b) What is its function?

........................................................................................................ (2)

........................................................................................................ (2)

(c) Why does the cardiovascular system need to work harder during exercise?

........................................................................................................ (2)

........................................................................................................ (2)

(Total: 6 marks)

34. The following table refers to the components of skill-related fitness, their definitions and examples of their use in sport. Complete the table. The first row is done for you.

<table>
<thead>
<tr>
<th>Component of Skill-Related Fitness</th>
<th>Definition</th>
<th>Example From Different Sporting Situations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-ordination</td>
<td>Accurate timing of movement of legs and hands</td>
<td>Moving into the correct position to return, and then returning the shuttle in badminton</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hold a handstand in gymnastics</td>
</tr>
<tr>
<td></td>
<td>The time it takes to respond to a stimulus</td>
<td>Side-stepping a player to go past them</td>
</tr>
<tr>
<td>Power</td>
<td>How fast you can move part or all of your body</td>
<td></td>
</tr>
</tbody>
</table>

(Total: 10 marks)
35. Ashan coaches the school football team. They are quite skilful players, but lack fitness in specific areas.

(a) What type of **TRAINING METHOD** could he suggest they use to increase their fitness in the areas listed below:

(i) Lack of leg strength................................................................. (1)
(ii) Lack of aerobic fitness............................................................. (1)
(iii) Lack of speed over short distances........................................... (1)

(b) Ashan has produced a personal exercise programme for each member of the team. Give **ONE** reason why he devised a separate programme for each player.

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

(c) When devising each person’s exercise programme, Ashan was careful to apply the necessary principles of training. How could you tell from a written record of the footballers’ Personal Exercise Plan that the following principles of training were being applied?

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

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

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

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

(Total: 6 marks)
36. Gemma is working on her personal exercise programme and has been told that exercises involving isometric muscle contractions would be of benefit to her.

(a) What is an ‘isometric muscle contraction’?

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

(b) Give a **sporting example** of when the body would perform an isometric muscle contraction.

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

(c) What is the other **main** type of muscle contraction?

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

(d) Gemma often uses fartlek training. Explain what is meant by **fartlek training**:

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

(e) The graph below shows Gemma’s heart rate during one of her training sessions.

![Graph showing heart rate over time](image)

(i) What is her resting heart rate?

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

(ii) When is she physically working her hardest?

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

(iii) Her heart rate remains the same value for several minutes. What does this suggest in terms of how hard she is working during this time?

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

(iv) Do you think she is working aerobically or anaerobically?

............................................................................................................................................................... (1)
(v) Give a reason for your answer in part (iv).

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

(vi) The outline of the graph suggests that Gemma is not using a fartlek training session.

How would you expect the graph to differ if she was?

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

(f) The graph is not complete. There is no indication of what happens to Gemma’s heart rate after she finishes exercising. Her heart rate should gradually return to her resting level.

(i) What is the term used to describe the return of the heart rate to its pre-exercise level?

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

(ii) Will a cool down increase or decrease the time taken for the heart rate to return to normal?

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

(iii) The cool down is an important phase of any training session. Why is it important in relation to heart rate?

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

(Total: 13 marks)

37. Nigel was told by his doctor that he was overweight.

(a) Define the term overweight.

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

(b) He was told to control his calorie intake by having a balanced diet. The doctor mentioned fats and carbohydrates. Name THREE other food groups Nigel should make sure he includes.

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

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

(iii) .................................................................................................................................................. (1)
(c) The doctor suggested that Nigel should consider his diet along with a Personal Exercise Programme.

How are these two factors linked?

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

(d) If Nigel has a tendency to build up a lot of fat what is his body somatotype likely to be?

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

(e) Give an example of a sporting activity where it would be an advantage to have this kind of extreme body type.

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

(Total: 7 marks)

38. Alex plays doubles at his tennis club. He has noticed that his partner is often short of breath during long rallies despite being fit. Alex thinks this is to do with his partner’s regular smoking.

(a) Why might smoking affect his performance in this way?

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

(b) Alcohol, like tobacco, is a socially acceptable drug. However, it too can impair sporting performance.

State a way in which alcohol may have a poor effect on performance:

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

(c) Top class (élite) performers in a variety of sports have been tempted to take socially unacceptable drugs. Anabolic steroids are ‘banned drugs’.

(i) What physical advantage would a sports performer have if they took anabolic steroids?

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

(ii) What type of sporting activity would this kind of drug be associated with?

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

(Total: 4 marks)
39. (a) What infection of the sole of the foot is usually associated with swimming pools?

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

(b) What type of infection is it?

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

(c) What type of infection is athletes's foot?

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

(Total: 3 marks)

40. In boxing, performers are grouped according to their weight rather than their age.

(a) What is the reason for this?

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

(b) Cuts are common injuries in boxing. If you had to treat a deep cut, what steps would you take?

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

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

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

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

(Total: 5 marks)
41. (a) Complete the following paragraph about the signs and symptoms of fractures. A fracture is a ................. in the bone. Sometimes the fractured bone may stick out through the skin. When this happens it is called a/an ................. fracture. There are several signs and symptoms of a fracture.

(b) Two of these are:

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

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

(Total: 4 marks)

42. (a) What is hypothermia?

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

(b) What might cause hypothermia?

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

(Total: 2 marks)

END