PHYSICAL EDUCATION STUDIES

**YEAR 11 GENERAL**

**Biomechanics and Exercise Physiology**

**2019**

**Question/Answer Booklet**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Task weighting: 7%**

***Time allowed for this paper***

Reading/planning time before commencing work: Five minutes

Working time for paper: Fifty minutes

|  |  |
| --- | --- |
| ***Material required/recommended for this paper***  **To be provided by the supervisor**  This Question/Answer booklet  Sections One and Two: Write your answers in this Question/Answer booklet.  Spare lined paper  **To be provided by the candidate**  Standard items:Pens, pencil, eraser, correction fluid, highlighter, ruler |  |

***Important note to candidates***

No other items may be taken into the examination room. It is **your** responsibility to ensure that you do not have any unauthorised notes or other items of a non-personal nature in the examination room. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further. All electronic devices are **NOT** permitted to be used unless arranged prior with the teacher. Students caught using electronic devices will automatically be given zero marks for the test.

***Structure of this paper***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Section | Number of questions available | Number of questions to be attempted | Suggested working time  (minutes) | Marks available |
| Section One:  Multiple Choice | 10 | 10 | 10 | 10 |
| Section Two:  Short Answer | 6 | 6 | 25 | 23 |
| Section Three:  Extended Response | 1 | 1 | 10 | 10 |
|  |  |  | Total Marks | 43 |

**Instructions to candidates**

1. The rules for the conduct of this exam have been outlined. Sitting this examination implies that you agree to abide by these rules.

2. Answer all questions according to the following instructions.

3. You must be careful to confine your responses to the specific questions asked and to follow any instructions that are specific to a particular question.

4. Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue an answer.

* Planning: If you use the spare pages for planning, indicate this clearly at the top of the page.
* Continuing an answer: if you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of the question(s) that you are continuing to answer at the top of the page

**Section One: Multiple Choice (10 marks)**

This section has 10 questions. Answer all questions. For each question circle the box to indicate your answer. Use only a blue or black pen to circle the correct answer. If you make a mistake, place a cross through that letter, do not erase or use correction fluid, and circle your new answer. Marks will not be deducted for incorrect answers. No marks will be given if more than one answer is completed for any reason.

1. Cardiorespiratory Endurance is
   1. Capacity of the body to do continuous physical activity for an extended period of time
   2. The ability of a muscle/muscle group to exert force repeatedly over an extended period of time
   3. The capacity of joint(s) to move through a full range of motion or the ability to bend
   4. The ability to change the position of the body quickly and efficiently
2. A sit and reach test is a
   1. Flexibility test
   2. Balance test
   3. Cardiorespiratory test
   4. All of the above
3. Which of the following is true?
   1. Health-related fitness components improve the performance of an athlete
   2. Static stretching is most suitable for warm up
   3. There are 4 types of motion
   4. A step test is used to test the cardiorespiratory endurance
4. Which of the following is a health related fitness?
   1. Power
   2. Reaction time
   3. Coordination
   4. Body Composition
5. An effective cool down involves \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
   1. Low intensity exercise which allow full range of motion
   2. Increasing the body flow through the muscles and therefore the oxygen supply
   3. Stimulates the hearts and lungs moderately and progressively
   4. Alerts the nervous system to the physical and mental demands of the vigorous exercise to come
6. The grip test is a test for the \_\_\_\_\_\_\_\_\_\_\_\_ fitness component.
   1. Body composition
   2. Cardiorespiratory Endurance
   3. Muscular Power
   4. Muscular Strength
7. Which is not an example of a performance related fitness component
   1. Agility
   2. Coordination
   3. Flexibility
   4. Speed
8. Which is not an immediate response of the circulatory system to Physical Activity
   1. Increased Heart Rate
   2. Max O2 uptake
   3. Increased Stroke Volume
   4. Decreased Blood Pressure
9. Which one is incorrect?

A warm up:

* 1. Increases the blood flow through the muscles and therefore the increase of oxygen supply.
  2. Increases body and muscle temperatures, which improves the elasticity of muscle fibres and tendons in preparation for more forceful contractions.
  3. Decrease the body temperature and heart rate
  4. Decreases muscle tension.

1. What is balance?
   1. The ability to maintain the body’s equilibrium while stationary or in motion
   2. The ability of the body’s senses, nervous system and muscles to perform specific movements smoothly and accurately
   3. The time between receiving a signal to move and the start of the actual physical response
   4. The capacity of a joint or joints to move through a full range of motion, or the ability to bend and stretch and twist without injury.

**Section Two: Short Answer (23 marks)**

1. Benjamin decided to go for a 5km run. Explain 3 immediate responses that his circulatory system would be experiencing. (9 Marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Choose any 3  1 mark for stating the immediate response   * 2 marks for full description * 1 mark for brief description  |  |  | | --- | --- | | Response | Description | | Increased Heart Rate | In order to provide a more rapid supply of blood to the muscles, the rate at which the heart beats increases during exercise. | | Increased Stroke Volume | The amount of blood the heart pumps out with each beat increases with activity. This occurs because more venous blood is being returned to the heart from the muscles. | | Increased Blood Pressure | This increases due to an increase in cardiac output. The fact that blood is travelling through the circulatory system at a faster rate results in greater pressure being applied to the artery walls. | | Selective redistribution of blood | During exercise, blood is directed away from non-working areas to active muscles | | Temperature regulation | To prevent overheating of muscle tissue, blood acts as a temperature regulator by transferring heat from within the body to the skin surface in the form of perspiration. | | Cardiac input | As Physical Activity begins, the muscles require more fuel and oxygen in order to produce energy for contraction | | Max VO2 uptake | The maximum amount of oxygen intake during physical activity | | 9 |
| **Total** | **/9** |

1. The respiratory system will have a different response to the circulatory system.
2. Explain two (2) immediate responses of the respiratory system. (6 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Choose any 2  1 mark for stating the immediate response   * 2 marks for full description * 1 mark for brief description  |  |  | | --- | --- | | Response | Description | | Total lung capacity | The amount of air in the lungs following a maximum inspiration  vital capacity + residual volume = total lung capacity. | | Vital capacity | The greatest volume of air that can be expired after maximum inspiration. | | Residual volume | The volume of air that remains in the lungs after a forced maximum expiration. | | Tidal volume | The amount of air you breathe in and out with a normal breath. | | Inspiratory reserve volume | The amount of air that you can breathe in after normal inspiration. | | Expiratory reserve volume | The amount of air that you can breathe out after normal expiration. | | 6 |
| **Total** | **/6** |

1. Benjamin an athlete has turned up to his training session to find that he has to complete a couple of fitness tests. One is the step test and the other is a grip test. Benjamin has never completed these tests before.
2. Explain to Benjamin what these tests are for and how they’re conducted.

(4 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| 2 Marks  (1 mark)   * The step test measures Cardiorespiratory Endurance.  (Health related fitness)   (1 mark)   * Using a stepping bench (~40cm high) the person begins to step for 3 minutes   + Heart rate it taken before and after step test is conducted   (2 marks)  (1 mark)   * The grip test measures Muscular Strength .  (Health related fitness)   (1 mark)   * + Squeeze the dynamometer as hard as possible.   + Repeat 3 times and record your best result | 4 |
| **Total** | **/4** |

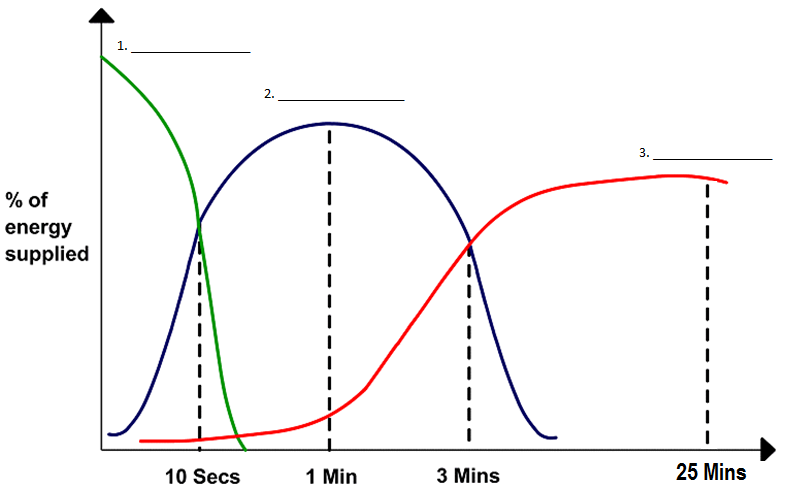
1. Explain two (2) reasons to Benjamin about why fitness testing is important.

(4 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| 2 Marks  Identify a person’s strengths and weaknesses so a training program can be designed to cater for the individual  2 marks  Test results are an effective means of providing feedback regarding initial fitness levels, improvements can be made as a result of training and necessary modifications to the exercise program.  Or any other reasonable response | 4 |
| **Total** | **/4** |

**Section Three: Extended Answer (10 marks)**

1. Complete the following graph and interpret the type of physical activity this athlete could be undergoing. Make reference to each energy system and the characteristics of each.



(10 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| 3 marks   1. ATP-CP 2. Lactic Acid 3. Aerobic   1 mark   * Any physical activity that would last ~25 minutes   + 3-6km run   + Swim   + Bike ride   6 marks   * 2 marks for each energy system – Makes reference to at least 3 points * 1 mark for brief description of each energy system – makes reference to less than 3 points  |  |  |  | | --- | --- | --- | | ATP-CP | LACTIC ACID | AEROBIC | | No Oxygen | No Oxygen | Oxygen | | Most rapid supply of energy | Rapid supply of energy | Slow supply of energy | | Uses chemical fuel – creatine phosphate (CP) | Uses food fuel – carbohydrates (glucose) | Uses food fuel – glucose, fats and protein | | Very limited ATP production | Limited ATP production  1 molecule of glucose – 2 molecules of ATP | Unlimited ATP production | | Used for high power activities  0-10 seconds | Used for activities of 1-2 minutes | Long distance endurance activities | | Muscle stores ATP and CP are limited | Lactic acid produced in reaction – causes fatigue | Only by-products are carbon dioxide and water | | 10 |
| **Total** | **/10** |

**SPARE PAGE**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_