

TEACHERS COLLEGE OF JAMAICA

BACHELOR OF EDUCATION

MAY 2017 – EXAMINATIONS

COMMON PAPER

PHYSICAL EDUCATION

KINESIOLOGY

[PE205SEB]

YEAR 1
SECONDARY

TIME: 2 ½ HOURS

INSTRUCTIONS:

1. This paper consists of three sections; answer ALL questions in Sections A and B and TWO questions from Section C.
 2. Write your answers in the answer booklet provided.
 3. The use of a silent, non-programmable, scientific calculator is permitted.
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Registration Number: _____

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

SECTION A – (30 MARKS)

Answer ALL questions in this section.

1. An athlete doing cleans in the gym displaces **289lbs** a distance of **6ft** in **4** seconds.
Calculate:
 - a. his power 2 marks
 - b. his horse power. 2 marks

2. A sprinter accelerates from **19m/s** to **27 m/s** in **5 seconds**. Calculate his rate of acceleration. 3 marks

3. An athlete ran **24km** west along a road-way, then changed direction and ran a further **15 km** north. He completed his run in **1hour and 27 minutes**. Calculate his average speed and average velocity during his run. 4 marks

4. Using the arm as a lever, assume that the biceps is flexing the forearm against a resistance (dumbbells) of **43 kg**. Note that the fulcrum is the elbow joint and the biceps are inserted **2.5cm** from the fulcrum. The distance from the fulcrum to the center of the dumbbell is **21cm**. Calculate the force needed to balance the lever. 4 marks

5. An athlete doing biceps curls is supporting a **108 kg** Dumbbell in his hand at a rotary angle of **53°**. Calculate the following:
 - a. Rotary Force 3 marks
 - b. Stabilizing force 3 marks
 - c. Mechanical advantage 3 marks
 - d. Torque (if the muscles are attached **0.4cm** from the center of the joint). 3 marks

6. Where S is equal to distance, g = gravitational constant, and t = time, calculate the time taken for a Gymnast to fall to the floor if he loses his grip from the balance beam which is **eleven (11)** feet from the floor. 3 marks

SECTION B – (30 MARKS)

Answer ALL questions in this section.

1. Explain how the *structure* of the following types of bones enables them to function effectively;

a. Long bones

1 mark

b. Short bones

1 mark

2. List THREE basic principles of stability.

a. _____

b. _____

c. _____

3 marks

3. Categorize the following muscle fiber arrangements and state the reason for your answer.



Figure 1

a.

b.

c.

3 marks

4. Describe clearly the following actions that take place at joints:

a. Flexion

1 mark

b. Adduction

1 mark

5. Muscles are named because of one or more distinctive characteristics. State TWO such characteristics and give an example of each.

Characteristics	Example

2 marks

6. Define EACH of the following terms in relation to muscle properties.

a. Contractility

2 marks

b. Extensibility

2 marks

7. Figure 2 shows an athlete doing two exercises. State the type of contraction occurring in each activity and give a reason for your answer.

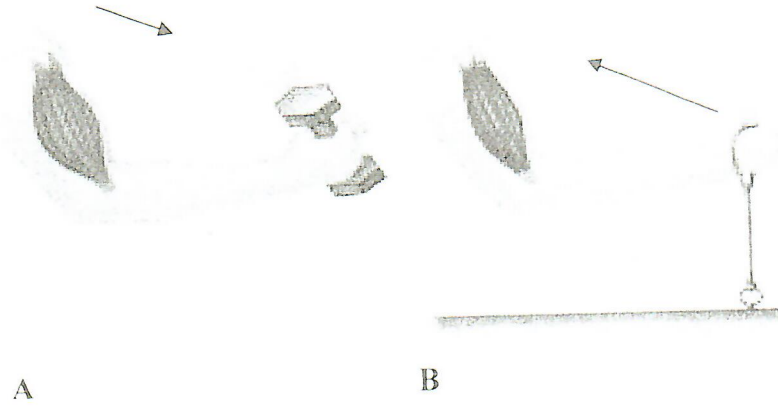


Figure 2

Activity A

Activity B

4 marks

8. State what are *proprioceptors*.

1 mark

9. What are the functions of the following proprioceptors as related to muscle contraction/s.

a. Meissner's Corpuscles

b. Pacinian Corpuscles

2 marks

10. a. State Newton's Third Law of Motion and discuss how its application can provide your athletes with a sporting advantage when performing in an event such as the Sprint start using a starting block or when executing the skill of blocking over the net in volleyball.

4 marks

b. Briefly examine Aristotle's contribution to the discipline of Kinesiology.

3 marks

SECTION C – (40 MARKS)

Answer any TWO questions in this section.

1. a. Analyze the action of the arms in performing the **set-shot in basketball (free throw)**.
In your response identify and justify the type of lever. (10 marks)
- b. State how it affects speed and accuracy in performance outcomes. (10 marks)

2. Analyze the actions of the **take-off** leg and both legs in the **landing phase** of the long-jump, when the sail technique is used. In your response identify the action of the levers in the provision for speed and power. (20 marks)

3. The squat is a type of exercise used to build strength in the lower body.
 - a. Deductively analyze the action of an athlete who is performing a squat routine as part of a training program. (10 marks)
 - b. Identify the type of levers that will generate power in this action. (10 marks)

4. Describe in detail the Kinesiology of walking/ambulation. Account for the action and movement in each phase. (20 marks)

END OF EXAMINATION