TEACHERS COLLEGE OF JAMAICA

BACHELOR OF EDUCATION

MAY 2016 – 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.

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 ran **27 km** west along a road-way, then changed direction and ran a further **30 km** north. He completed his run in **45 minutes**. Calculate his average speed and the average velocity during his run. (4 marks)

2. Using the arm as a first class lever, assume that the Biceps are flexing the forearms against a resistance (dumbbells) of **23 kg**. Note that the fulcrum is the elbow joint and the Biceps are inserted **2.5 cm** from the fulcrum. The distance from the fulcrum to the center of the dumbbell is **21 cm**. Calculate the force needed to balance the lever. (4 marks)

3. An athlete doing 'cleans' in the gym displaces **217 lbs** a distance of **5 ft** in **4** seconds. Calculate his power and horse power. (4 marks)

4. An athlete doing biceps curls is supporting a **88 kg** dumbbell in his hands at an angle of $\mathbf{60^0}$. Calculate the following;

   a) Rotary and Stabilizing forces. (6 marks)
   b) Mechanical advantage (3 marks)
   c) Torque (if the muscles are attached **0.5 cm** from the center of the joint). (3 marks)

5. A sprinter accelerates from **16 m/s** to **21 m/s** in **4 seconds**. Calculate his acceleration. (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 **nine** feet from the floor. (3 marks)

SECTION B – (30 MARKS)

Answer ALL questions in this section.

7. Explain how the *structure* of the following types of bones enable them to function effectively;

   (a) Long bones

   _____

   _____

   _____

   1 mark

   (b) Short bones

   _____

   _____

   _____

   1 mark

8. List THREE basic principles of stability.

   (a) _____

   (b) _____

   (c) _____

   3 marks

9. State the axial arrangement, movement allowed and ONE example of EACH of the following joints

   (a) Pivot

   (b) Saddle

Joint	Axial arrangement	Movement allowed	Example

3 marks

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

(a) Flexion

_____

_____

1 mark

(b) Adduction

_____

_____

1 mark

(c) Rotation

_____

_____

1 mark

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

Characteristics	**Example**

2 marks

12. Define EACH of the following terms regarding muscle properties.

(a) Irritability

_____

_____

_____

_____

2 marks

(b) Elasticity

_____

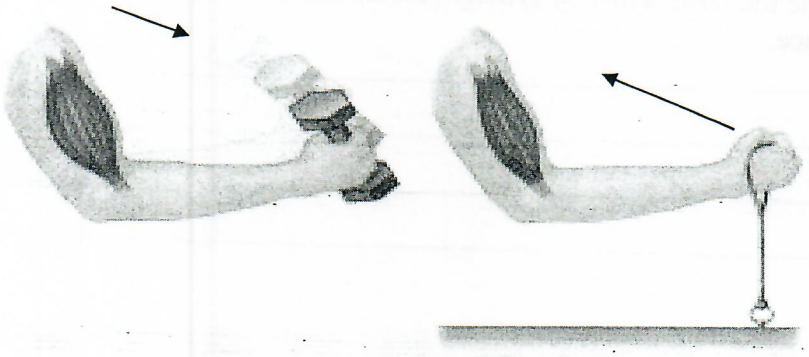
_____

_____

_____

2 marks

13. Figure 1 shows an athlete doing two exercises and the arrows indicate movement of the fore arm. State the type of muscle contraction occurring in each activity and give a reason for your answer.



A B

Figure 1

6 marks

Activity A

_____

_____

Activity B

_____

_____

14. List TWO sensory receptors that provide us with feedback on muscle action.

(i) _____

(ii) _____

2 marks

15. (a) State Newton's Third Law of Motion and discuss how its application can provide athletes with a sporting advantage during their performance of a named event.

4 marks

(c) Define the term *centre of gravity* (COG) and state its relationship in achieving balance.

3 marks

SECTION C – (40 MARKS)

Answer question 16 and ONE other question.

16. Analyze the action of the arms in performing the **set-shot in basketball**. Identify the levers and explain how they provide speed and accuracy. 20 marks

17. Analyze the actions of the legs in the **takeoff and landing phase** of the long jump. Identify the action of the levers in the provision for speed and power. 20 marks

18. Analyze the action of the **trail leg in the hurdles event. Account for joint and muscle** action and their provision for power and speed. 20 marks

19. Analyze the action of the **passing leg** when successfully executing a push pass in the game of football. 20 marks

END OF EXAMINATION