Sports, exercise and health science
Standard level
Paper 2

Tuesday 8 November 2016 (morning)

1 hour 15 minutes

Candidate session number

Instructions to candidates

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Section A: answer all questions.
- Section B: answer one question.
- Write your answers in the boxes provided.
- A calculator is required for this paper.
- The maximum mark for this examination paper is **[50 marks]**.

16 pages

8816 – 6602

Section A

Answer **all** questions. Write your answers in the boxes provided.

1. A study recorded students' perceptions of their physical, cognitive and social involvement when being taught abdominal exercises, under three different teaching styles:

Lesson 1 – Command style
Lesson 2 – Practice style
Lesson 3 – Problem-solving style.

The mean and standard deviation (SD) of the scores are shown in the table below, with higher mean scores indicating more involvement.

	Involvement					
	Physical		**Cognitive**		**Social**	
Teaching Style	Mean	SD	Mean	SD	Mean	SD
Command	5.45	0.86	3.96	1.16	4.51	0.89
Practice	5.34	0.93	4.75	0.98	4.24	1.00
Problem-solving	5.61	0.84	5.38	0.76	4.45	0.99

[Source: adapted from Sanchez *et al.,* (2012), *Students' perceptions of the command, practice, and inclusion styles of teaching. Physical Education and Sport pedagogy, vol 17, no.3*, pages 317-330]

(a) State which teaching style has the highest level of social involvement. [1]

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(b) Using the data, outline how standard deviation is useful for comparing students' perceptions of teaching styles. [1]

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(Question 1 continued)

(c) Discuss the hypothesis that teaching style can affect students' perceptions of their physical and cognitive involvement in abdominal exercises. [3]

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(d) Outline how perceived exercise intensity can be measured using the Borg scale. [2]

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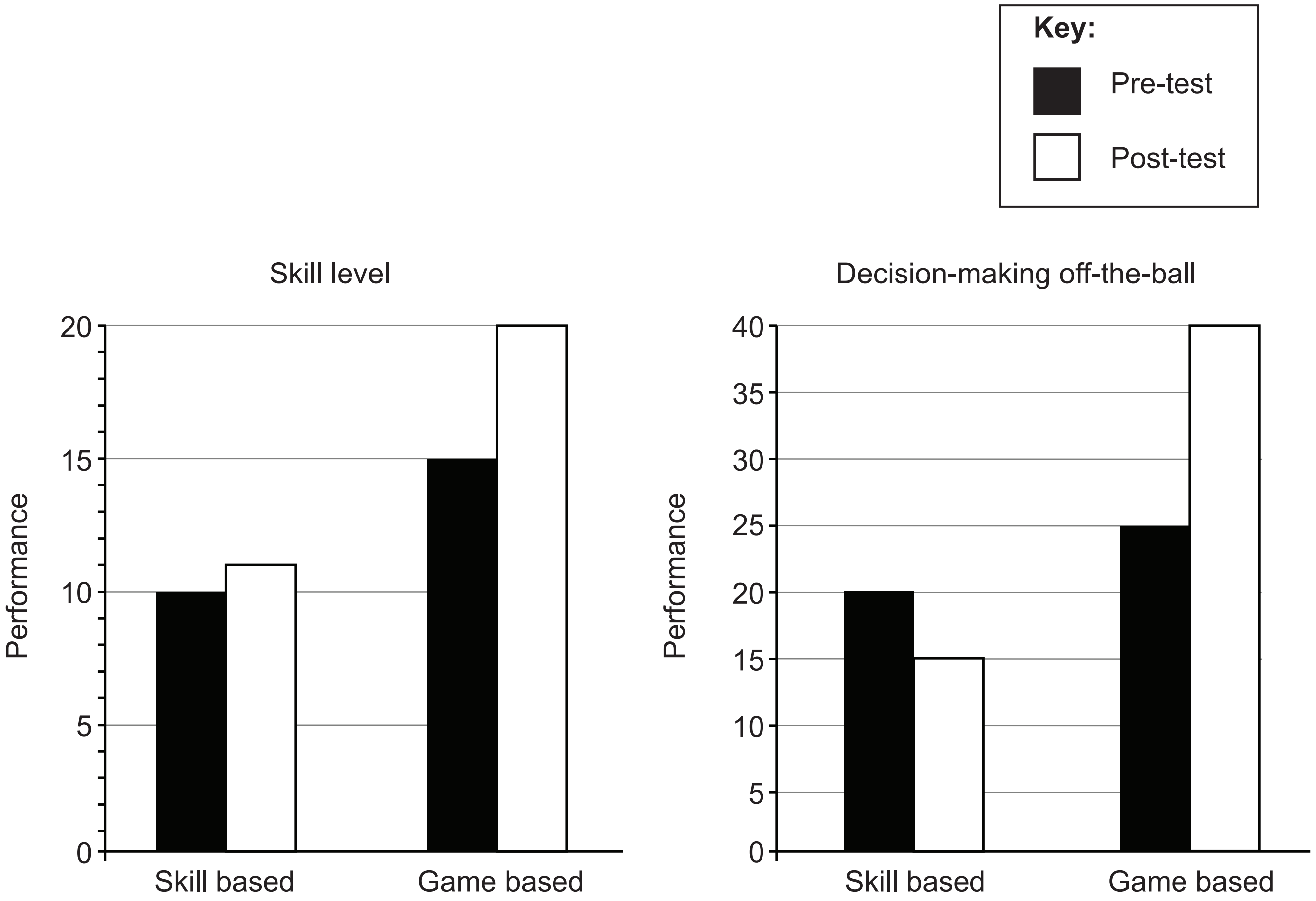
Turn over

(Question 1 continued)

A second study measured the effects of a skill based and a game based teaching approach on students' performance in basketball.

The bar chart below shows the mean pre-test and post-test scores for students' skill level and decision-making off-the-ball abilities. A higher score indicates better performance.



[Source: IBO]

(e) State the mean pre-test game based score for skill level. [1]

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(Question 1 continued)

(f) Analyse the effect of **one** teaching approach on skill level and decision making off-the-ball, referring to the data in your answer. [2]

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(g) Explain how physical maturation can contribute to different rates of learning a new skill. [2]

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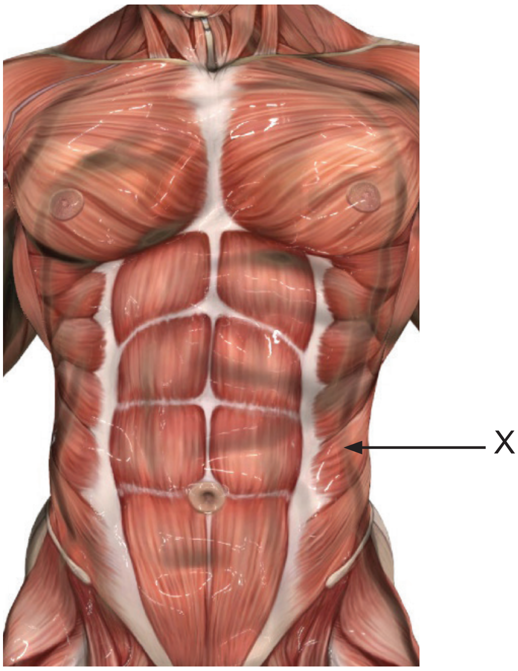
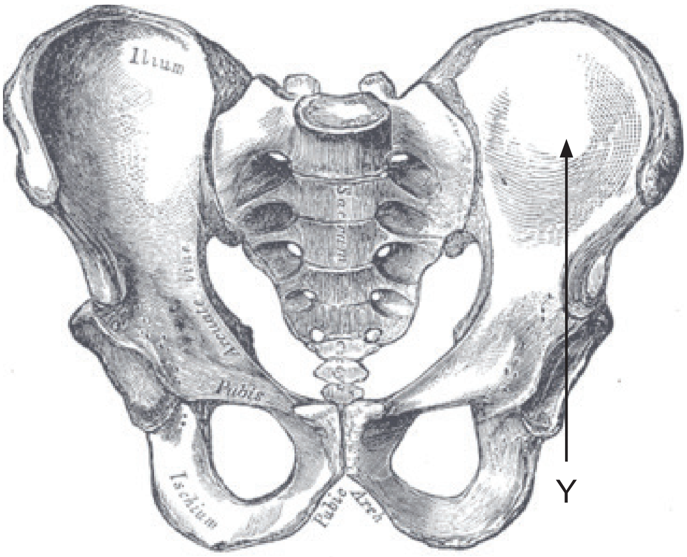
2. (a) List the names of the muscle labelled X and the pelvic bone labelled Y in the diagrams below. [2]



[Source: http://www.publicdomainpictures.net/pictures/170000/velka/muscle-man-2.jpg]



[Source: https://upload.wikimedia.org/wikipedia/commons/thumb/9/98/Gray241.png/375px-Gray241.png]

X. . . . .

Y. . . . .

(b) State the type of synovial joint that is found at the distal end of the femur. [1]

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(c) Analyse the ankle joint movement at take-off when rebounding in basketball in relation to joint action and type of muscle contraction. [2]

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3. (a) List **one** type of blood cell. [1]

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(b) State the receptor in the aorta which responds to carbon dioxide and pH levels in the blood. [1]

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(c) Outline the role of cholinesterase in muscle contraction. [2]

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(d) Explain the role of myosin in muscle contraction after adenosine triphosphate (ATP) is broken down and releases energy. [3]

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4. (a) (i) State the chemical composition of a glucose molecule. [1]

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(ii) Explain how glucose molecules combine to form disaccharides and polysaccharides. [2]

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(b) Outline the function of glucagon in relation to the breakdown of glycogen when fasting. [1]

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(c) Describe the strengths of the ATP-CP system with regard to the re-synthesis of ATP during a 50-metre sprint. [2]

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Section B

Answer **one** question. Write your answers in the boxes provided.

5. (a) Outline the structural components of skeletal muscle. [5]

(b) Analyse the systolic blood pressure response of an endurance runner. [4]

(c) Describe the production of ATP by the lactic acid system. [5]

(d) Explain the importance of reliability and validity in fitness testing, for a sport of your choice. [6]

6. (a) Explain the process of gaseous exchange between the lungs and pulmonary capillaries at rest **and** during exercise. [5]

(b) Compare and contrast the characteristics of the lactic acid and aerobic system. [5]

(c) Describe the characteristics associated with the three phases (stages) of learning, with reference to the progression from novice to skilled performance. [6]

(d) Outline why sports science students must be careful when interpreting the correlation between two variables. [4]

7. (a) Explain the mechanics of pulmonary ventilation in the human lungs at rest. [6]

(b) The following diagrams show high jumpers using the Fosbury flop and scissors techniques.

Diagram 1: Fosbury flop

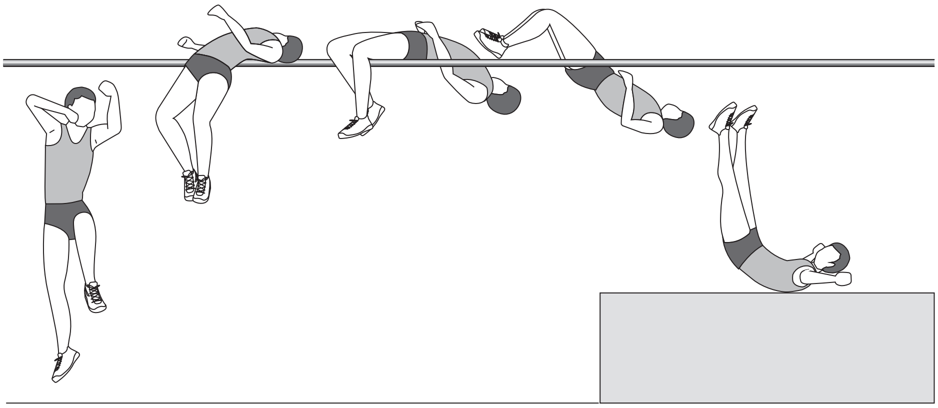
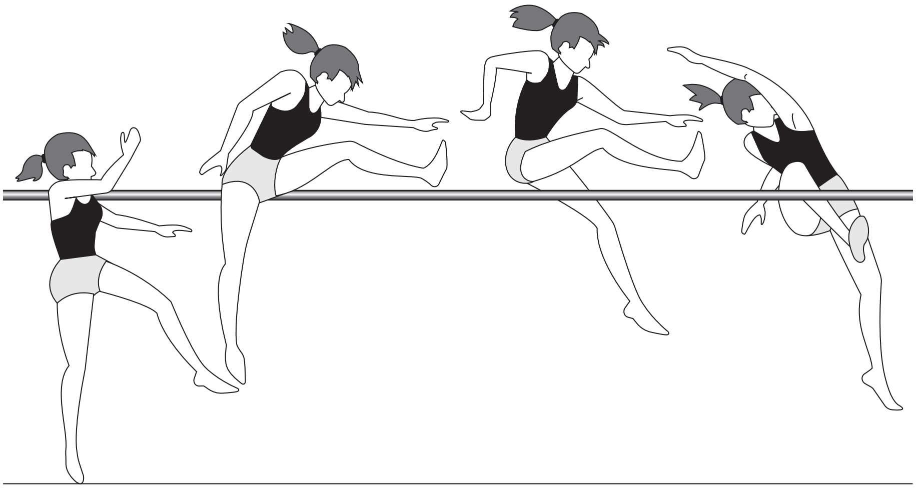


Diagram 2: scissors technique



[Source: © International Baccalaureate Organization 2016]

Distinguish between the position of the centre of mass of a high jumper using the Fosbury flop and the scissor technique. [4]

(c) Explain how the application of Newton's third law of motion enables an athlete to run uphill. [4]

(d) Outline **three** types of transfer that a sports coach needs to take into account when planning a practice, with reference to sporting examples. [6]