OCR
Oxford Cambridge and RSA

Cambridge **TECHNICALS LEVEL 3**

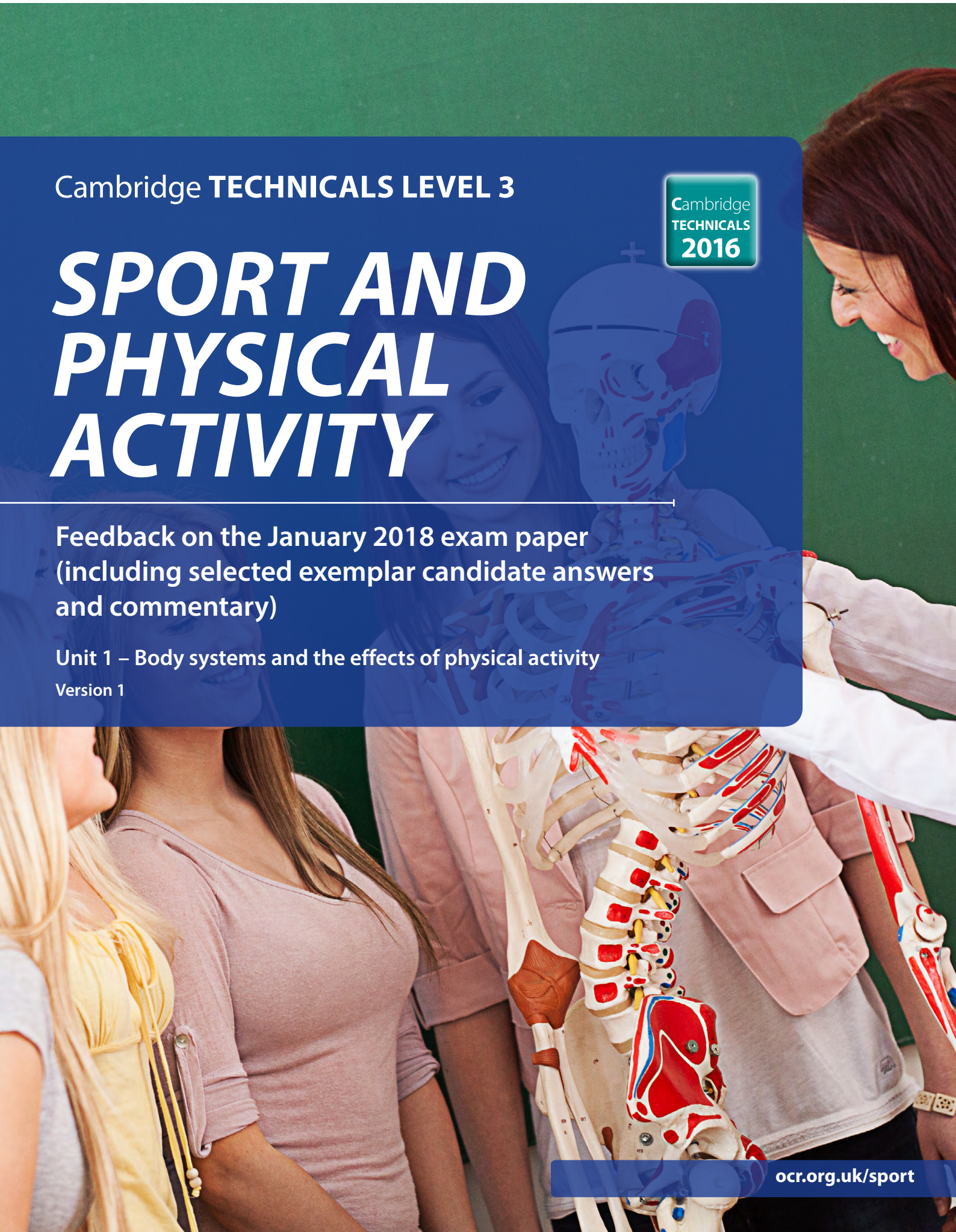
Cambridge TECHNICALS 2016

SPORT AND PHYSICAL ACTIVITY

Feedback on the January 2018 exam paper (including selected exemplar candidate answers and commentary)

Unit 1 – Body systems and the effects of physical activity

Version 1



CONTENTS

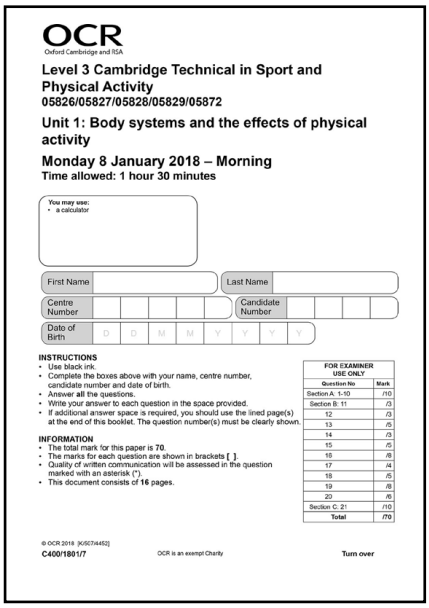
INTRODUCTION

This resource brings together the questions from the January 2018 examined unit (Unit 1), the marking guidance, the examiners comments and the exemplar answers into one place for easy reference.

We have also included exemplar candidate answers with commentary for questions 15(a), 15(b) and 21.

The examiner's comments are taken from the Report to Centre for this question paper.

The Question Paper, Mark Scheme and the Report to Centre are available from:
https://interchange.ocr.org.uk/Modules/PastPapers/Pages/PastPapers.aspx?menuindex=97&menuid=250



OCR
Oxford Cambridge and RSA

Level 3 Cambridge Technical in Sport and Physical Activity
05826/05827/05828/05829/05872

Unit 1: Body systems and the effects of physical activity

Monday 8 January 2018 – Morning
Time allowed: 1 hour 30 minutes

You may use:
- a calculator

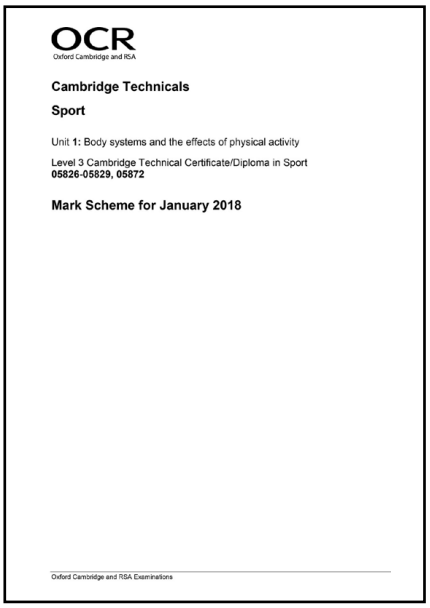
First Name | Last Name
Centre Number | Candidate Number
Date of Birth (D D M M Y Y Y Y)

INSTRUCTIONS
- Use black ink.
- Complete the boxes above with your name, centre number, candidate number and date of birth.
- Answer all the questions.
- Write your answer to each question in the space provided.
- If additional answer space is required, you should use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.

INFORMATION
- The total mark for this paper is 70.
- The marks for each question are shown in brackets [ ].
- Quality of written communication will be assessed in the question marked with an asterisk (*).
- This document consists of 16 pages.

FOR EXAMINER USE ONLY	
Question No	Mark
Section A: 1-10	/10
Section B: 11	/3
12	/3
13	/5
14	/3
15	/5
16	/8
17	/4
18	/5
19	/8
20	/6
Section C: 21	/10
Total	/70

C400/1801/7 OCR is an exempt Charity Turn over



OCR
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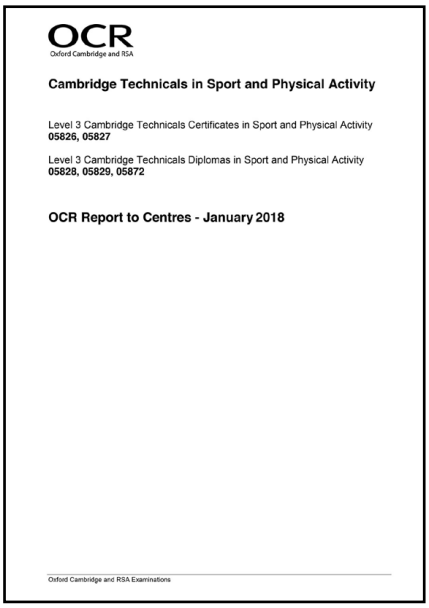
Cambridge Technicals
Sport

Unit 1: Body systems and the effects of physical activity

Level 3 Cambridge Technical Certificate/Diploma in Sport
05826-05829, 05872

Mark Scheme for January 2018

Oxford Cambridge and RSA Examinations



OCR
Oxford Cambridge and RSA

Cambridge Technicals in Sport and Physical Activity

Level 3 Cambridge Technicals Certificates in Sport and Physical Activity
05826, 05827

Level 3 Cambridge Technicals Diplomas in Sport and Physical Activity
05828, 05829, 05872

OCR Report to Centres - January 2018

Oxford Cambridge and RSA Examinations

GENERAL EXAMINER COMMENTS ON THE PAPER

In this examination series, many candidates were well prepared for questions on most aspects of the specification, although some individual centres were less well prepared in one or two topic areas. Most candidates again managed their time effectively with little evidence of running out of time to complete the paper. Most scored well with the multi-choice questions at the beginning of the paper.

In Section C of the paper where candidates are required to write an extended answer, candidates showed a better standard of written communication than the previous series, with the vast majority sticking to the requirements of the question rather than going off the point.

The most demanding parts of the paper for many candidates were questions 15, 16b, 18 and Q20, whichwas often left unanswered.

Resources which might help address the examiner comments:

From the link below, you'll find 'The OCR guide to examinations' (along with many other skills guides)
http://www.ocr.org.uk/i-want-to/skills-guides/

Command verbs definitions
http://www.ocr.org.uk/Images/273311-command-verbs-definitions.pdf

Questions 1, 2 and 3

Section A

Answer **all** the questions. Put a tick (✓) in the box next to the **one** correct answer for each question.

1 Which one of the following is a normal value for cardiac output at rest?

(a) 2 litres/minute ☐

(b) 5 litres/minute ✓

(c) 8 litres/minute ☐

(d) 10 litres/minute ☐

[1]

2 Which one of the following muscles contracts to cause knee extension?

(a) Vastus medialis ✓

(b) Tibialis anterior ☐

(c) Adductor magnus ☐

(d) Semimembranosus ☐

[1]

3 Which one of the following types of joint allows no movement between the articulating surfaces of its bones?

(a) Fixed ✓

(b) Cartilaginous ☐

(c) Synovial ☐

(d) Condyloid ☐

[1]

Mark scheme guidance

One mark for each correct answer.

Questions 4, 5 and 6

4 Which one of the following is **not** a short term effect of exercise on the cardiovascular system?

(a) Heart rate increases ☐

(b) Arterioles dilate ☐

(c) Blood pressure increases ☐

(d) Amount of haemoglobin increases ✓

[1]

5 Which one of the following is the correct definition of tidal volume?

(a) The volume of oxygen inspired per breath ☐

(b) The volume of carbon dioxide expired per breath ☐

(c) The volume of air inspired per breath ✓

(d) The volume of air inspired per minute ☐

[1]

6 Which one of the following muscle fibre types would be most beneficial to a 400 metre hurdler?

(a) Fast glycolytic fibres ☐

(b) Slow glycolytic fibres ☐

(c) Fast oxidative fibres ✓

(d) Slow oxidative fibres ☐

[1]

Mark scheme guidance

One mark for each correct answer.

Questions 7, 8, 9 and 10

7 Which one of the following is the correct order of respiratory passages that air would pass through during expiration?

(a) Bronchi – trachea – nasal cavity - epiglottis ☐

(b) Bronchi – alveoli – bronchioles - epiglottis ☐

(c) Bronchioles – trachea – epiglottis - larynx ☐

(d) Bronchioles – bronchi – trachea - larynx ☑

[1]

8 Which one of the following is a pair of bones that are both part of the axial skeleton?

(a) Cranium and ribs ☑

(b) Ilium and cranium ☐

(c) Scapula and ilium ☐

(d) Scapula and ribs ☐

[1]

9 State what happens to breathing frequency after exercise is completed.

It decreases/slows down ..**[1]**

10 What feature in the veins of the legs prevents the backflow of blood and allows blood to travel upwards towards the heart?

(Pocket) valves ..**[1]**

Mark scheme guidance

Questions 7 and 8:

One mark for each correct answer.

Question 9:

Do not accept: returning to normal

Question 10:

Do not accept: any valves of the heart e.g. Tricuspid valve = x.

Examiner comments

Questions 1 – 10

Questions 1–8 were multi-choice type questions. A very small minority did not respond to one or more of these, with most answering them well. The questions that proved the most challenging were questions 2, 4, 5 and 6.

Candidates advised to read question and all answers carefully before committing to a particular answer. Candidates are advised to look for and/or highlight key words in each question.

Candidates should beware of a negative question e.g. which is not a ... and lung volumes relate to air, not oxygen. Candidates are also reminded to be aware of and to recognise the specific muscles within the quadriceps and hamstrings.

Candidates are also advised to re-visit these multi-choice questions again if they have time.

Very few scored 10/10 for the multi-choice section.

Question 11

Section B

Answer **all** the questions.

11 **Fig. 11.1** shows a diagram of the bones of the lower leg.

Fig.11.1

Identify A, B and C on the diagram.

A.. Tibia ...**[1]**

B.. Talus ...**[1]**

C.. Metatarsal ....**[1]**

Mark scheme guidance

Do not accept:

A = Fibia/tibula – No Benefit of Doubt – no mark given.

C = Metatarples – No Benefit of Doubt – no mark given.

Examiner comments

Very few candidates scored the full three marks available for this question. Many could identify the Tibia and Metatarsals but most struggled with labelling the Talus – with many simply writing 'ankle bone'.

Question 12

12 **Fig. 12.1** shows a performer doing a tuck jump.

Fig. 12.1

Complete the table below to identify the joint types and movements during the tuck jump.

Joint	Joint type	Movement
Hip	Ball and socket	Flexion
Elbow	Hinge	Flexion

[3]

Examiner comments

Many answered this question well and scored the full three marks available, although a minority of candidates incorrectly labelled the movement at the elbow as extension rather than flexion.

Question 13

13 **Fig.13.1** shows a pike jump.

Fig. 13.1

Complete the paragraph by filling in the missing words using the box below.

agonist	extension	iliopsoas	eccentric
deltoid	fixator	antagonist	gluteus maximus
concentric	latissimus dorsi	isometric	flexion

When performing a pike jump, the gymnast causes ..... flexion .....at the hip joint with a ..... concentric ..... contraction of the ..... iliopsoas ..... muscle. This muscle is the ..... agonist ..... during this movement. On landing, the gymnast returns to an upright position by contracting the .... gluteus maximus ...muscle.

[5]

Examiner comments

This was answered well by most candidates who worked through the 'word bank' to find the appropriate words. Most were able to correctly identify flexion, but many confused the contraction type. Most correctly identify the word agonist but many put incorrect muscle names especially for iliopsoas.

Questions 14 and 15

14 A cyclist will use all three muscle fibre types at different times during a race.

State which muscle fibre type would be used in the following stages of a race:

During a long hill climb .....

Fast oxidative or Type 2a .....

Maintaining a steady pace mid-race .....

Slow (oxidative) or Type 1 .....

Sprinting for the finish line .....

Fast glycolytic or Type 2b .....

[3]

15 **(a)** Outline **three** long term benefits of regular physical activity on the muscular system.

1. (Muscle) hypertrophy/increase in size/strength/force/endurance .....
2. (Muscle) hyperplasia or more (muscle) fibres .....
3. Increase in size/density of mitochondria .....
4. Increase in myoglobin (stores) .....
5. Increase in glycogen (stores) .....
6. Increase in metabolism of triglycerides/fats or increase in fat stores .....
7. Increase in tendon strength .....
8. Increased capillarisation .....

.....

.....**[3]**

(b) Describe how a warm up improves the efficiency of the muscles.

1. Increased flexibility/range of movement (at joint) .....
2. Increased speed of oxygen delivery to muscles **or** more oxygen to muscles .....
3. Increase in muscle temperature .....
4. Increased elasticity/extensibility of muscle or can stretch **further** .....
5. Increased speed/force of contraction or muscles work faster .....
6. Increased speed of nerve impulses .....
7. Increased enzyme activity .....
8. Reduced muscle soreness/DOMS/lactic acid build up .....

.....

.....**[2]**

Mark scheme guidance

Question 14:

Do not accept:

Fast or fast twitch for 1 or 3.

Slow glycolytic = Benefit of Doubt – mark given

Question 15(a):

Mark first three benefits only.

Do not accept:

- Quicker recovery
- Less chance of injury
- Increased elasticity/flexibility
- Less lactic acid build-up

Question 15(b):

Do not accept:

- Reduced risk of muscle injury
- Increased blood flow
- Can loosen up

Examiner comments

Question 14 – This question was to identify the appropriate muscle fibre type and it proved very difficult for many to score the full three marks available. Many were unable to identify fast oxidative or slow oxidative, but most were able to give fast glycolytic for the third answer. Simply writing fast twitch was not good enough to score marks for this Level 3 examination.

Questions 15(a) and (b) – Many candidates started their answer by re-writing part of the question – there is no need to do this and merely wastes valuable time.

In Q15a most candidates identified hypertrophy as part of their outline and some described hyperplasia but very few achieved the third mark. Candidates are reminded that three separate points are required for a three-mark question.

In 15b, many candidates scored the full three marks showing a good understanding of how a warm-up improves the efficiency of muscles. Candidates did not score any marks for saying that muscles 'get warmer' because this is simply a repeat of the question.

Exemplar Candidate Work

Question 15(a) – high level answer

15 (a) Outline three long term benefits of regular physical activity on the muscular system.

One benifit is muscle hypertrophy where the muscle gets bigger and stronger. Another is muscle hyperplasia which is the splitting of muscle fibres so there will be more and they can contract more strongly around the muscle. Another benifit would capillarisation. This would allow the muscle to have a better blood supply, so more energy.

[3]

Commentary

This is a high-level answer because the candidate has correctly identified three long-term benefits of regular physical activity on the muscular system. These are: muscle hypertrophy; muscle hyperplasia and capillarisation. A better answer for the third point would be to state that an increase in capillarisation occurs, although the term 'capillarisation' does imply an increase in the number of capillaries. The candidate has gone beyond the demand of the question because they have explained the long-term benefits as well as outlining them.

This question asks for a specific number of answers, in this case three. Only the first three responses by the candidate will be considered by the marker.

Question 15(b) – high level answer

(b) Describe how a warm up improves the efficiency of the muscles.

It increases range of movement of the muscles by increasing their temperature. Muscles become ready for exercise as ~~blood~~ more blood begins to flow to them to increase their effciency

[2]

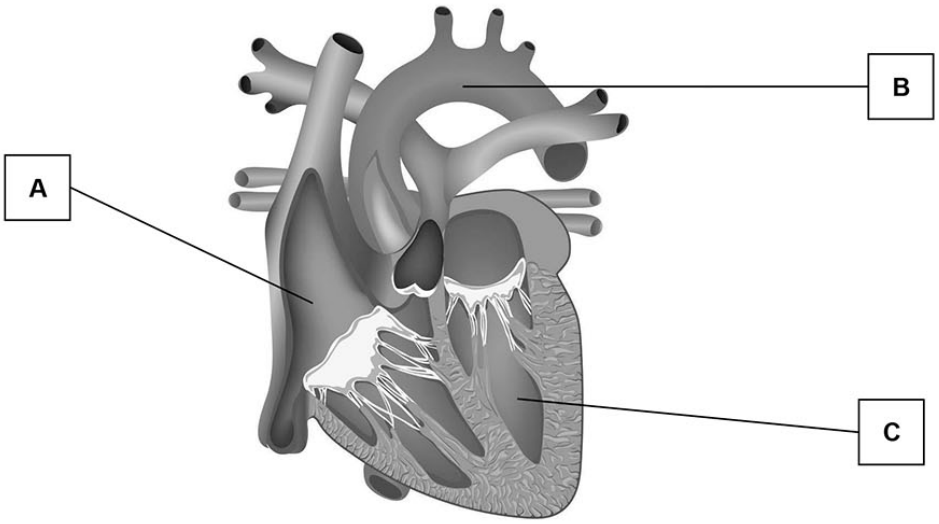
Commentary

This is a high-level answer because the candidate has correctly described two ways that a warm up improves the efficiency of muscles. The candidate has stated that a warm up increases the range of movement of muscles, and increases the temperature of muscles. Other responses could state that a warm up increases oxygen delivery to the muscles, reduces lactic acid build-up, and increases the elasticity of muscles. It is important to note that warming muscles would not be acceptable because this is a repeat of the word used in the question.

This question does not ask for a specific number of responses, and so all responses will be considered by the marker.

Question 16

16 (a) Fig. 16.1 shows a diagram of the heart.



Identify A, B and C and describe the role of each in the circulation of blood.

A. Right atrium

Description. Receives (de-oxygenated) blood from body **or** pumps/transports/sends (de-oxygenated) blood into right ventricle

B. Aorta

Description. Carries (oxygenated) blood (from L ventricle) to tissues/body/muscle

C. Left ventricle

Description. Pumps/transports/sends (oxygenated) blood out of the heart/to body/ into aorta

[6]

(b) Describe the role of arterioles during exercise.

1. (During exercise) arterioles (vaso)dilate
2. To allow **more** blood to the working muscles
3. (and) (vaso)constrict to non-essential organs/stomach/gut

[2]

Mark scheme guidance

Question 16(a):

Identification must be correct for mark to be given for description i.e. If identification incorrect then mark cannot also be given for description.

Do not accept:

- Pumps blood – No Benefit of Doubt – no mark given

Question 16(b):

Do not accept:

- Become wider
- Arterioles dilate and constrict = 1 mark only

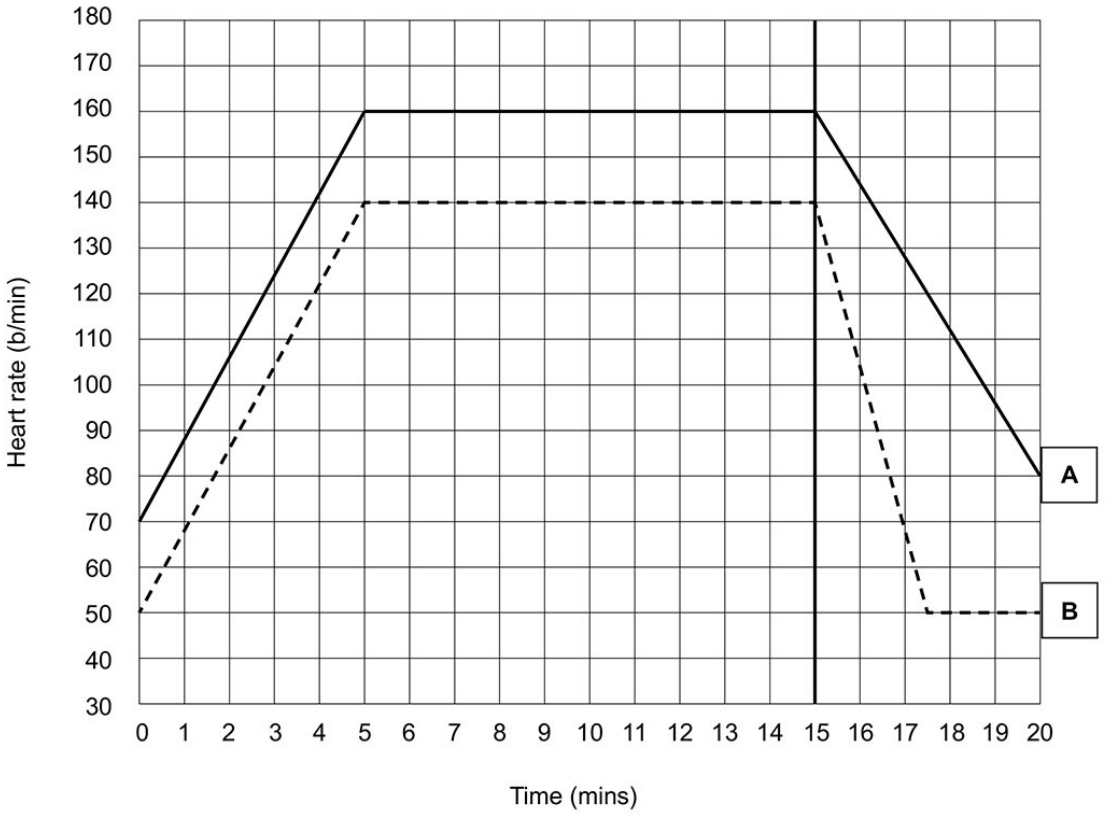
Examiner comments

Questions 16(a) and (b) – Although most could identify the structures of the heart, many were unable to back each up with an accurate description of the role of each structure. The role has to identify where the blood has come from or where it was going to and some left this important information out.

In 16b, many candidates answered this poorly with few marks being scored. The question is about the role of arterioles during exercise and therefore only those who described vasodilation and vasoconstriction and the flow of blood scored marks.

Question 17

17 The graph below shows the heart rate of two performers, A and B, performing the same sub-maximal exercise for 15 minutes, followed by a 5 minute recovery period.



Describe and account for the differences between the two performers.

1. (account) **B** is fitter/trained performer **or A** is a less fit/untrained performer
2. (describe) **B** has lower resting heart rate than **A or A** has higher resting heart rate
3. (account) because **B** has higher stroke volume/stronger heart **or A** has lower SV/less strong heart
4. (describe) **B** has steady state at lower HR/lower working HR **or A** has steady state at higher HR/higher working HR
5. (account) due to greater efficiency at using oxygen **or** less oxygen needed (at any exercise intensity)
6. (describe) **B** shows quicker recovery/has returned to resting heart rate before **A or B** has returned to resting heart rate between 17 and 18 minutes/within 3 minutes
7. (account) **B** is able to get rid of waste products/lactic acid quicker

.....[4]

Mark scheme guidance

Sub max 2 for **describing** differences.

Sub max 2 for **accounting** for differences.

Candidate may talk about one or other graph to gain marks e.g. A has steady state plateau higher due to needing more oxygen to work = Pt 4 (implies B is lower).

Examiner comments

Most candidates scored at least one mark for this four-mark question. Most described and did not account for the differences between the two performers. Half the marks available were for accounting for the differences and half for the description. The question asked for differences and so those that wrote of similarities were unable to access the marks available.

Questions 18 and 19

18 Explain the mechanics of breathing during inspiration using the following terms:

External intercostals	diaphragm	rib cage	thoracic cavity	pressure

1. External intercostals contract
2. Diaphragm contracts/flattens
3. Rib cage moves up/out
4. Volume of thoracic cavity increases
5. Pressure in lungs is reduced

[5]

19 Describe gaseous exchange at the alveoli by filling in the missing words below:

In the alveoli the partial pressure of oxygen is ..... high ..... and the partial pressure of carbon dioxide is ..... low ..... , whereas in the blood capillaries at the alveoli the partial pressure of oxygen is ..... low ..... and the partial pressure of carbon dioxide is ..... high ..... . Gases move from areas of ..... high ..... to ..... low ..... pressure. Therefore . carbon dioxide . diffuses into the alveoli and .... oxygen ..... diffuses into the capillaries surrounding them.

[8]

Mark scheme guidance

Question 18:

Candidates may write a sentence using more than one word e.g. external intercostals and diaphragm contract = 2 marks.

E.g. Rib cage moves up, increasing volume of thoracic cavity and decreasing pressure inside lungs = 3 marks.

Do not accept:

- Diaphragm moves up
- Makes lungs larger.

Question 19:

Accept alternative valid words for high/low e.g. great/small, increased/decreased.

Examiner comments

Question 18 – Candidates that fully explained the mechanics of breathing during inspiration, using all the terms available in the 'word bank, scored well.

Too many candidates got themselves confused with the mechanics of inspiration with the mechanics of expiration and so scored few marks. Those that scored marks explained the roles of the diaphragm, external intercostals and the ribs and it was only the most able candidates who were able to effectively explain the role of the thoracic cavity and pressure.

Question 19 – This was generally well-answered, with most candidates scoring at least two marks. Those that did not score full marks often got the last sentence wrong with the actions of carbon dioxide and oxygen the wrong way around.

Question 20

20 There are three stages to the aerobic system. In the first stage glucose is converted to pyruvic acid. In the second stage hydrogen is released, and in the third stage a very large amount of ATP is produced.

(a) Name the **three** stages of the aerobic system.

1st stage ... (Aerobic) glycolysis .....

2nd stage .. Krebs/citric acid cycle .....

3rd stage ... Electron transport/transfer chain .....

[3]

(b) State how much ATP the aerobic system produces from the complete breakdown of **one** glucose molecule.

1st stage ... = 2 (ATP) .....

2nd stage .. = 2 (ATP) .....

3rd stage ... = 32-34 (ATP) .....

[3]

Examiner comments

This question was the weakest answered of them all, with some candidates leaving the whole question unanswered. Very few scored the full six marks available. Knowledge of the three energy systems is expected for this specification but many did not know the three stages of the aerobic system in 20a.

In 20b, few got all three marks – more scored a mark for the 3rd stage.

Question 21

Section C

21* Describe the positive and negative impacts of physical activity and sport on the skeletal system, using practical examples to support your answer. **[10]**

(Positives)

1. Stronger/thicker bones
   - Caused by high impact/weight-bearing exercise
   - increased bone density
   - Increased calcium/collagen
   - Prevents/protects from injury to bones
2. Increased stability/stronger joints
   - Stronger ligaments/tendons
   - Prevents sprains/dislocations
3. Prevents osteoporosis
   - Which is reduced bone density/weakening with age
   - Can affect young people as well as older people
4. Reduced risk of (osteo)arthritis
   - Exercise thickens (articular/hyaline) cartilage
   - Which covers the ends of adjacent bones
   - More/improved synovial fluid produced
   - Reduces friction/wear and tear at joints
   - Joints better able to absorb shock
   - Most common in weight-bearing joints/knee/hip/ankle
5. Improved posture
   - Increased strength of core stability muscles
   - Reduces likelihood of lower back pain/spine curvature
   - Named back problems e.g. sciatica, scoliosis
6. Weight management
   - Maintain a balanced active healthy lifestyle
   - Prevent sedentary lifestyle (leading to e.g. osteoporosis)

(Negatives)

7. Increased risk of (osteo)arthritis
   - Overuse/poor technique can cause wear and tear/loss of (articular/hyaline) cartilage
   - Reduced production of synovial fluid
   - Friction between bone surfaces
   - Formation of bone spurs
   - High impact activities/repetitive actions are risk factor
   - Weight bearing joints e.g. knee/hip/ankle
8. Chronic/overuse injuries
   - Repetitive actions cause damage
   - Tendonitis injuries e.g. tennis/golfers elbow
   - Stress fractures e.g. shin splints
   - E.g. Osgood Schlatter's disease/bursitis
9. Acute/impact injuries
   - Contact sports e.g. football/rugby
   - Fractures/dislocations/torn cartilage/ligaments
   - Can lead to arthritis in later life
   - Can lead to sedentary lifestyle during recovery **or** to avoid repeat injury

(Conclusions)

10. Negatives can be minimised
    - Use of correct techniques
    - Avoid overtraining/follow principles of training
    - Apply moderation/progressive overload

Mark scheme guidance

Level 3 (8–10 marks)

A comprehensive answer:

Detailed knowledge and understanding.

Effective analysis/critical evaluation and/or discussion/explanation/development.

Clear and consistent practical application of knowledge.

Accurate use of technical and specialist vocabulary.

High standard of written communication.

At Level 3 responses <u>are likely</u> to include:

Detailed knowledge and understanding of both positive and negative impacts of physical activity on the skeletal system.

Most points are developed.

At the top of this level bone and joint structures are considered and a range of specific conditions are named.

Practical examples are clearly relevant and linked to most points made.

At the bottom of this level both positives and negatives are considered and a few specific conditions, such as osteoporosis, arthritis and shin splints are named and/or described. Practical examples are clearly relevant and linked to many points made.

Level 2 (5–7 marks)

A competent answer:

Satisfactory knowledge and understanding.

Analysis/critical evaluation and/or discussion/explanation/development attempted with some success.

Some success in practical application of knowledge.

Technical and specialist vocabulary used with some accuracy.

Written communication generally fluent with few errors.

At Level 2 responses <u>are likely</u> to include:

Satisfactory knowledge and understanding of impact of physical activity on the skeletal system.

Points made but generally not developed.

At the top of this level both positives and negatives have been identified, and some have been described, such as stronger bones, arthritis prevention and examples of chronic or high impact injury.

Practical examples are mostly relevant and linked to many points made.

At the bottom of this level a few points have been made but there may be more focus on either negatives or positives, and specific conditions may not be named. Some practical examples are relevant and some are linked to points made.

Level 1 (1–4 marks)

A limited answer:

Basic knowledge and understanding.

Little or no attempt to analyse/critically evaluate and/or discuss/explain/develop.

Little or no attempt at practical application of knowledge.

Technical and specialist vocabulary used with limited success.

Written communication lacks fluency and there will be errors, some of which may be intrusive.

At Level 1 responses <u>are likely</u> to include:

Basic knowledge of the impact of physical activity on the skeletal system.

At the top of this level at least three effects are likely to have been identified and at least one has been described. They may all be either positive or negative impacts, and there may be inaccuracies. Few or no practical examples are relevant and few if any linked to points made.

To score 1 mark one effect of exercise on the skeletal system has been named or described.

[0 marks] No response or no response worthy of credit.

Examiner comments

This ten-mark question is marked using a levels response mark scheme with descriptors that enable Examiners to pinpoint a mark from the responses they read.

Many candidates answered this question well and took into account both the positive and negative impacts. A few of the lower scoring candidates stuck with either positive or negative and too many candidates ignored the demand to use practical examples to support their answer.

Candidates are reminded that using practical examples is often a feature of these extended questions and for them to be prepared to use relevant practical examples throughout their answer.

The better scoring candidates pleasingly gave detailed knowledge and understanding of the impacts of activity on the skeletal system, a common feature of these good candidates is that they use the correct technical vocabulary throughout their answer. Some candidates tended to wander off the point and write in detail about the muscular system and therefore scored few marks.

This extended question is also assessed on the quality of written communication and the better responses again showed a fluent and accurate approach, with few spelling errors and with good use of clear sentences and paragraphs. Weaker candidates again showed poor structure and accuracy in spelling.

Exemplar Candidate Work

Question 21 – medium level answer

21* Describe the positive and negative impacts of physical activity and sport on the skeletal system, using practical examples to support your answer. **[10]**

One Postive effect of Sport on the skeletal system would be that bone density increaseds. the more you exercise the stronger and more dence your bones becomes this has positive impacts such as reduced chance of injury (fracture or break) also this will delay the process of osteoperosis which happens to everybody. Just at different times another positive effect is that you will have increased bone marrow, bone marrow produce red blood cells and red blood cells carry oxygen to the working muscles so the more you have the better as it will increase endurance

A negative effect of sport on the skeletal system would be that over time cartilage around joints will wear away until it is all gone this is how arthiritis is obtained. once cartilage is all bath worn bone will start to grind against bone causing alot of discomfort for the performer

Commentary

This question is levelled-response question that takes into account knowledge and understanding, analysis and evaluation, practical application and correct use of technical vocabulary.

This response is a medium-level answer and has achieved level 2. The candidate states that exercise improves bone density which makes bones stronger and reduces the chance of injuries. They also state that osteoporosis is delayed. The candidate also makes one developed point on a possible negative effect of exercise, which describes the impact of arthritis as cartilage is worn away from the surface of bones. However, the candidate does not make any attempt to apply these points to practical sporting examples.

This response would become a level 3 answer by describing more benefits of exercise on the skeletal system such as increased strength and stability of joints and ligaments, strengthening of cartilage and improved posture. Each of the points should be developed. For example, improved posture would reduce the occurrence of lower back problems such as sciatica. These points should be supported by examples; for example, high-impact activities are best for increasing bone density. Moreover, the negative impacts of regular exercise may include overuse injuries such as shin splints from too much running on hard surfaces, and tendonitis injuries such as tennis elbow, caused by repetitive movements in sports such as tennis. Fractures and dislocations can also be a result of physical activity and these should also be linked to specific sporting examples, such as a dislocated shoulder in rugby.

Exemplar Candidate Work

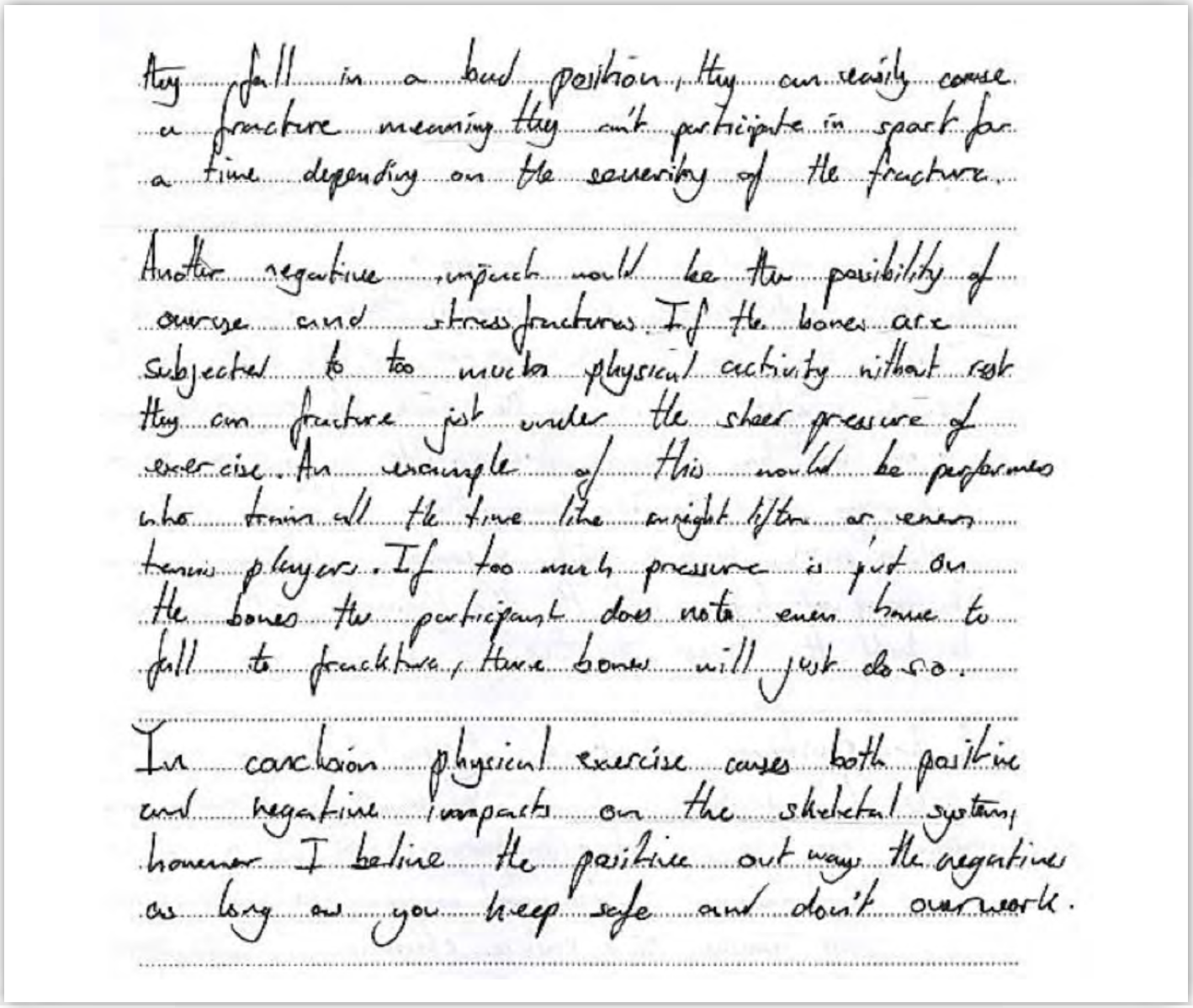
Question 21 – high level answer

21* Describe the positive and negative impacts of physical activity and sport on the skeletal system, using practical examples to support your answer. [10]

There are many positive impacts of exercise on the skeletal system. The first is we get stronger ligaments and tendons. This means ~~there~~ we are less likely to dislocate our joints. An example of this would be in weight lifting, because the weight the performers are carrying can be so large, there shoulder C ball and socket joint may dislocate, this bones then unable to compete and in pain, however with stronger tendons and ligaments this may not happen as the the ligament will be able to hold the bones together.

Another positive impact of physical activity on the skeletal system would be denser bones. Denser bones means less chance of osteoporosis. This is a condition where the bones get brittle and so weak that they can break very easily. The reduce chance of osteoporosis means older competitors in sport can compete for longer. Moreover denser bones means less chance of fracturing your bones which means you if you fall running you will more likely be able to recover and carry on.

However physical activity can cause a multitude of negative impacts & on the skeletal system for example when doing physical activity you have a higher chance of breaking of fracturing your bones. An example of this is a cyclist, falling off his/her bike. It



they fall in a bad position, they can easily cause a fracture meaning they can't participate in sport for a time depending on the severity of the fracture.

Another negative impact would be the possibility of overuse and stress fractures. If the bones are subjected to too much physical activity without rest they can fracture just under the sheer pressure of exercise. An example of this would be performers who train all the time like an eight litre or seven tennis players. If too much pressure is put on the bones the participant does not even have to fall to fracture, there bones will just do so.

In conclusion physical exercise causes both positive and negative impacts on the skeletal system, however I believe the positive out way the negatives as long as you keep safe and don't overwork.

Commentary

This question is levelled-response question that takes into account knowledge and understanding, analysis and evaluation, practical application and correct use of technical vocabulary.

This is a high-level answer that achieved level 3.

The candidate has described several impacts of practical activity on the skeletal system, both positive and negative. These points have all been developed and linked to practical examples. The answer also states that the negative impacts cause injuries which may prevent participation in exercise in the future. The candidate makes an excellent evaluative comment that the positives outweigh the negatives if overtraining is avoided.

This answer could have been improved by explaining that regular exercise can improve posture and help avoid lower back problems, or that high-impact exercises such as running are best to increase bone density, and a negative may be an increased risk of arthritis, which can be caused by repetitive high-impact activity such as running on hard surfaces. Moreover, the candidate could have developed their evaluation of the positives and negatives by stating in more detail how the negatives can be minimised by using the correct techniques and applying the principles of training. However, skeletal injuries can never be fully avoided because of the nature of sports. For example, a collision in rugby can lead to a fracture, dislocation or damage to ligaments.

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