



*Rewarding Learning*

**ADVANCED SUBSIDIARY (AS)  
General Certificate of Education**

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**Sports Science and the  
Active Leisure Industry**

Unit AS 2

The Active Leisure Industry:  
Health, Fitness and Lifestyle

**[SAL21]**

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**Assessment**

**MARK  
SCHEME**

## **General Marking Instructions**

### ***Introduction***

Mark schemes are intended to ensure that the GCE examinations are marked consistently and fairly. The mark schemes provide markers with an indication of the nature and range of candidates' responses likely to be worthy of credit. They also set out the criteria which they should apply in allocating marks to candidates' responses.

### ***Assessment objectives***

Below are the assessment objectives for GCE Sports Science and the Active Leisure Industry.

Candidates must:

demonstrate knowledge and understanding of sports science and the active leisure industry (AO1);  
apply knowledge, understanding and skills through different contexts appropriate to the sports science and the active leisure industry (AO2); and  
analyse and evaluate evidence to make reasoned and valid judgements about sports science and the active leisure industry (AO3).

### ***Quality of candidates' responses***

In marking the examination papers, examiners should be looking for a quality of response reflecting the level of maturity which may reasonably be expected of a 17-year-old or 18-year-old which is the age at which the majority of candidates sit their GCE examinations.

### ***Flexibility in marking***

Mark schemes are not intended to be totally prescriptive. No mark scheme can cover all the responses which candidates may produce. In the event of unanticipated answers, examiners are expected to use their professional judgement to assess the validity of answers. If an answer is particularly problematic, then examiners should seek the guidance of the Supervising Examiner.

### ***Positive marking***

Examiners are encouraged to be positive in their marking, giving appropriate credit for what candidates know, understand and can do rather than penalising candidates for errors or omissions. Examiners should make use of the whole of the available mark range for any particular question and be prepared to award full marks for a response which is as good as might reasonably be expected of a 17-year-old or 18-year-old GCE candidate.

### ***Awarding zero marks***

Marks should only be awarded for valid responses and no marks should be awarded for an answer which is completely incorrect or inappropriate.

### ***Types of mark schemes***

Mark schemes for tasks or questions which require candidates to respond in extended written form are marked on the basis of levels of response which take account of the quality of written communication.

Other questions which require only short answers are marked on a point for point basis with marks awarded for each valid piece of information provided.

### **Levels of response**

Tasks and questions requiring candidates to respond in extended writing are marked in terms of levels of response. In deciding which level of response to award, examiners should look for 'best fit' bearing in mind that weakness in one area may be compensated by strength in another. In deciding which mark within a particular level to award to any response, examiners are expected to use their professional judgement.

### **Quality of written communication**

Quality of written communication is taken into account in assessing candidates' responses to all tasks and questions that require them to respond in extended written form. These tasks and questions are marked on the basis of levels of response. The description for each level of response includes reference to the quality of written communication.

For conciseness, quality of written communication is distinguished within levels of response. An example follows:

Level 1: Quality of written communication is basic.

Level 2: Quality of written communication is good.

Level 3: Quality of written communication is excellent.

In interpreting these level descriptions, an example is provided below. Examiners should refer to the specific guidance given within the mark scheme for each question:

**Band 1 (Basic):** The candidate makes only a limited selection and use of an appropriate form and style of writing. The organisation of material will lack clarity and coherence. There is little use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear.

**Band 2 (Good):** The candidate makes a reasonable selection and use of an appropriate form and style of writing. Relevant material is organised with clarity and coherence. There is some use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning clear.

**Band 3 (Excellent):** The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is organised with a high degree of clarity and coherence. There is widespread and accurate use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a sufficiently high standard to make meaning clear.

**1 (a)** Answers may address some of the following points:

- Sedentary/inactive lifestyle.
- Obesity.
- Hypertension/High blood pressure.
- High stress levels.
- Diabetes.
- Diet high in salt, sugar and fat would increase levels of LDLs in the blood.
- High blood cholesterol.
- Smoking.

Award [1] for the naming of each risk factor.

All other valid points will be given credit.

(2 × [1])

(AO1)

[2]

**(b)** Answers may address some of the following points:

- Damaging relationships with family, friends or work colleagues.
- Getting involved in anti-social or criminal behaviour, e.g. alcohol fuelled violence, vandalism, theft, domestic violence.
- Increased likelihood of accident, e.g. road accident, accidental fire, accidental fall or drowning.
- Loss of job, e.g. repeated absence, poor performance, financial consequences of job loss.
- Becoming a victim of crime, e.g. mugging or assault.

Award [1] for a brief description of effect and up to [2] for full description of effect.

All other valid points will be given credit.

(2 × [2])

(AO2)

[4]

**(c)** Answers may address some of the following points:**An active lifestyle:**

- An active lifestyle can prevent CHD. Individuals need to participate regularly in physical activity. Government guidelines recommend 30 minutes/5 days a week for adults and 60 minutes for children.
- Individuals need moderate intensity exercise which will increase the heart rate, working within the appropriate age related training zone.
- Exercising appropriately will improve the efficiency of the heart and circulatory system. It will increase the levels of HDLs (high density lipoproteins) and help break down LDLs (low density lipoproteins).
- An active lifestyle can reduce stress levels. Individuals will be less likely to suffer from hypertension.

**A balanced diet:**

- A low fat, high fibre, balanced diet will help prevent CHD.
- A low cholesterol diet will help prevent a build-up of plaque or atheroma on the walls of the coronary arteries.
- Food consumption needs to be considered and adapted to prevent CHD. Food high in salt, sugar and fat needs to be reduced. Foods high in saturated fat will increase levels of LDLs in the blood. Foods high in unsaturated fats can increase levels of HDL and help reduce blockage in arteries. Low salt intake will be a preventative measure against CHD.

**Reduction in alcohol consumption:**

- Excess alcohol consumption is linked as a contributing factor to CHD. A reduction in alcohol consumption and drinking in moderation is recommended.

- Follow current government recommended alcohol intake guidelines (3–4 units per day for a man, 2–3 units per day for a woman and 14 units recommended over a week and spread drinking over 3 days or more).
- Long term heavy drinking can raise blood pressure increasing risk of heart attack.
- Weight gain from excessive drinking can increase blood pressure.
- Heavy drinking weakens the heart muscle, which means the heart cannot pump blood as efficiently. This is known as cardiomyopathy and can cause heart failure.
- Avoid binge drinking as it can make the heart beat irregularly. This can increase blood pressure and increase risk of heart attack.

**Cessation of smoking:**

- Giving up smoking will reduce risk of developing CHD.
- Smoking damages the lining of arteries leading to a build-up of fatty material (atheroma) which narrows the artery.
- The carbon monoxide in tobacco smoke reduces the amount of oxygen in the blood. The heart is under pressure to pump harder to supply the body with the oxygen it needs.

Award [1] for identification of lifestyle improvement and up to [2] for the description.

All other valid points will be given credit.

(2 × [3])

(AO1, AO2)

[6]

**(d) The quality of written communication is assessed in this question.**

Answers may address some of the following points:

**Change4life:**

- Change4life is a government backed campaign launched in 2009. This campaign aims to create a movement in which everyone in society plays their part, helping to create fundamental changes in behaviours that can help people lead healthier lives.
- Change4life aims to help people make small, sustainable changes yet significant improvements to their diet and activity levels. It uses the slogan ‘eat well, move more, live longer’.
- In 2010 Change4life launched an anti-obesity campaign targeting 45–65 year olds. The aim of this campaign was to encourage this demographic to ‘swap it, don’t stop it’. This campaign encouraged this age group to adopt a healthier lifestyle by making a series of swaps such as swapping passive leisure activities for active leisure activities, reducing portion sizes and encouraged this demographic to make improvements in diet.
- In 2014 Change4life launched a healthy eating campaign. It encourages and supports families to make one easy health swap to their everyday food and drink to cut out high amounts of sugar and fat from their diet.
- Change4life encourages people to adopt healthy behaviours.
- Sugar swaps – Change4life provides advice on information about sugar found in foods and suggestions for healthier alternatives. This educates people and impacts on people’s health, reducing levels of obesity.
- Choose less alcohol – Change4life provides advice on ways for adults to cut down on alcohol consumption to within government lower risk guidelines and raising awareness of the hidden calories in alcohol.
- Get going everyday – Change4life provides advice on why it is important to lead an active lifestyle. This is an excellent way to manage weight, burning off excess calories and reducing chances of obesity.

**5 A Day Initiative:**

- The Government-led 5 A Day Initiative is aimed at getting people to increase the amount of fruit and vegetables they consume on a daily basis.
- 5 A Day highlights the health benefits of getting five 80g portions of fruit and vegetables daily which can help to improve and maintain people's health, boost the immune system, have a healthy body, lowers the chances of disease and infection, e.g. reducing the risk of heart disease, obesity, type 2 diabetes, stroke and some cancers.
- Enables people to achieve a balanced diet by incorporating fruit and vegetables, addressing vitamin and mineral consumption. Fruit and vegetables are low in fat and calories, enabling people to maintain a healthy weight and keep the heart healthy.
- The Government-led 5 A Day programme aims to increase fruit and vegetable consumption by raising awareness of the health benefits and improving access to fruit and vegetables through targeted action.
- The 5 A Day programme has five strands which are underpinned by an evaluation and monitoring programme. School fruit and vegetable scheme, local 5 A Day initiatives, national/local partners (Government Health Consumer Groups), Communication programme including 5 A Day logo, working with industry – producers, caterers and retailers.
- The main barrier to eating more fruit and vegetables is access to good quality, affordable fruit and vegetables.

**GP Referral Scheme:**

- The GP Referral Scheme, also known as exercise-on-prescription aims to promote a healthier lifestyle for individuals with certain medical conditions. With increasing numbers of patients suffering from chronic illnesses in the UK, the benefits of exercise in disease prevention has become more prevalent.
- The GP Referral Scheme lasts for 12 weeks and is supervised by qualified staff, working in conjunction with medical staff. The clients will be given a safe and effective training programme which is the start to a more active, healthier lifestyle.
- The GP Referral Scheme uses exercise to assist post-operative recovery, improvement in mobility, tackle insomnia, reduction/relief of back pain and aid weight loss, as well as improving fitness and self-esteem.
- Research has shown that regular exercise, using the GP Referral Scheme as a starting point for clients, can improve a broad range of physical and psychological medical conditions including diabetes, obesity, angina, asthma, hypertension, anxiety and depression.

**Cycle to work scheme:**

- The Cycle to work scheme is a tax incentive which aims to encourage employees to cycle to and from work.
- The benefits of cycling have a major impact on the health of employees, physically, mentally and socially.
- Weight loss, reduced stress levels, increased productivity, reduction in absenteeism and the overall good health of employees have been shown to be the result of the cycle to work scheme.
- The Cycle to work scheme makes a big contribution to health and well-being of staff and makes physical activity an integral part of employees' lifestyle.

**COVID-19 initiatives**

- Discussion must include how government COVID-19 campaign/initiative aims to improve the health of the nation.

All other valid points will be given credit.

**Level 1 ([1]–[3])****Overall impression: Basic**

- Basic knowledge and understanding of government initiatives that aim to improve the health of the nation. The candidate may include basic examples.
- Demonstrates a basic ability to discuss how government initiatives aim to improve the health of the nation. Candidate will give basic explanations.
- Quality of written communication is basic. The candidate makes a limited selection and use of appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialised vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear.

**Level 2 ([4]–[6])****Overall impression: Good**

- Good knowledge and understanding of government initiatives that aim to improve the health of the nation. The candidate will provide relevant examples.
- Demonstrates a good ability to discuss how government initiatives aim to improve the health of the nation. The candidate will provide some explanations.
- Quality of written communication is good. The candidate makes a reasonable selection and use of appropriate form and style of writing. Relevant material is organised with some clarity and coherence. There is adequate use of specialised vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning clear.

**Level 3 ([7]–[8])****Overall impression: Excellent**

- Excellent knowledge and understanding of government initiatives that aim to improve the health of the nation. The candidate will provide fully developed examples and show excellent understanding.
- Demonstrates an excellent ability to discuss how government initiatives aim to improve the health of the nation. The candidate will provide thorough explanation and will use a variety of relevant examples.
- Quality of written communication is excellent. The candidate successfully selects and uses an appropriate form and style of writing. Relevant material is organised with a degree of clarity and coherence. There is extensive and accurate use of specialist vocabulary. Presentation, spelling, punctuation and grammar are of a high standard and ensure meaning is clear.

[0] is awarded for a response not worthy of credit

(AO1, AO3)

[8]

20

2 (a) Answers may address some of the following points:

**Socio-economic:**

- Inability to meet costs of participation – transport, entry fees, club membership, specialist equipment.
- Less opportunities in communities.
- Poorer health and mortality rates.
- Suffer exclusion – less power, less disposable income.
- Low self-esteem and feelings of inadequacy.

**COVID-19 Restrictions**

- Closure of active leisure facilities and sporting clubs.
- Travel restrictions.
- Inability to meet up in groups/teams for training.
- Need to isolate due to positive test/close contact.

**Ethnic Groups:**

- Some ethnic communities do not regard sport as viable career path.
- Parental expectations may not include the benefits of participating in sport so children may not be encouraged by parents to participate.
- Low participation rates linked to strict religious beliefs.
- Can be difficult for women to participate due to traditions.
- Many ethnic minority groups live in poverty and lack the financial means to participate in sport.
- Stereotyping exists – channelling of certain ethnic groups into certain sports, e.g. Afro-Caribbeans into track and field, football and cricket.

**Disability:**

- Limited opportunities and programmes for participation, training and competitions.
- Limited range of sporting clubs accessible to disabled athletes.
- Lack of specialised equipment/adaptable equipment available.
- Limited funding.
- Limited specialised coaching.
- Lack of role models in communities to promote sport for disabled athletes.

**Gender:**

- Research has shown that for most sport and physical activity participation is higher amongst men.
- Domestic role – women have traditionally had to bear the greater burden of domestic work, reducing the time they have available for leisure.
- Social stereotyping – society is still less positive about female sports participation in some sports compared to males.
- Less media coverage – there has traditionally been less media coverage of female sport. This does not raise the profile of women's sport and there are fewer role models to aspire to.
- Traditionally less money and power is associated with women in sport. Women generally earn less money than men and occupy fewer positions of power in society, in the workplace and consequently in sporting institutions where decisions are made.

**Age:**

- Sport and active leisure activities are traditionally associated with youth/younger generation. Older people may lack the confidence/self-esteem to take up or return to a sporting activity.
- Less opportunities for active leisure/sport available for this demographic.

- Cost implications as the older person may be retired and may not have disposable income available to pay for activities/cover membership fees/buy equipment.
- Transport to facilities that provide activities may not be available to the older person as they may not drive and public transport may not be suitable.
- As a person ages they are more likely to suffer illness or injuries and this may restrict the activities they are able to take part in.
- Lack of role models.

Award [1] for the identification of factor, and up to [2] for the explanation.  
All other valid points will be given credit.

(3 × [3])

(AO1, AO2)

[9]

(b) (i) Answers may address some of the following points:

**Lower muscular strength due to:**

- Less muscle mass – lower strength.
- Less HGH – reduced tendency for muscle growth.
- Less testosterone – slower recovery time.
- Extra collagen fibres laid down between muscle fibres – reduces elasticity of the muscle.
- Degeneration of nerves supplying muscle.

**Lower level of cardiovascular endurance due to:**

- Decreased elasticity of cardiac muscle.
- Decreased stroke volume.
- Decrease in total blood volume.
- Decrease in size and density of mitochondria – less efficient use of O<sub>2</sub>.

**Lower Resting Metabolic rate due to:**

- General lack of exercise.
- Loss of lean muscle tissue.

**Less flexible due to:**

- Wear and tear of connective tissue – ligaments and cartilage.
- Reduced joint mobility.
- Increased collagen content within skeletal muscle and scar tissue.

Award [1] for a basic description and up to [2] for full description.

All other valid points will be given credit.

(2 × [2])

(AO2)

[4]

(ii) Answers may address some of the following points:

- A healthy and active lifestyle helps the individual 'feel good'. This is caused when the body releases chemicals called endorphins. Endorphins help relieve pain and stress. Physical activity also stimulates the release of dopamine, norepinephrine and serotonin. These chemicals regulate mood. These 'happy hormones' contribute to the individual's enjoyment of life.
- A healthy and active lifestyle can help relieve stress, anxiety and depression. The mind is occupied when exercising, which can act as a distraction from the problems of daily life.
- A healthy and active lifestyle can improve concentration, enhance memory and learning, leading to better performance and results for an individual.

- A healthy and active lifestyle particularly participation in sport can provide excitement to an individual's life. It allows a person to challenge themselves, set goals and feel a sense of achievement.
- Improves self-esteem through an enhanced body image.
- Improves self-confidence and self-worth, being part of a group/team in a positive environment.
- Can relieve aggression – aggression is channelled into sport/activity, in a more positive controlled manner.
- Reduced feelings of lethargy and fatigue. The individual has more energy to keep going and cope better with everyday activities and demands.
- Provides opportunities to participate in risk taking behaviour for, e.g. rock climbing/abseiling. This is a healthy approach to pushing boundaries and experiencing an adrenalin rush.

Award [1] for identification of psychological benefit and [1] for full description.

All other valid points will be given credit.

(3 × [2])

(AO1, AO2)

[6]

19

3 (a) (i) Answers may address some of the following points:

- Proper technique – Correct lifting and lowering of weights must be coached to avoid injury.
- Coach must assess the capability, age and strength of the individual prior to weight lifting to avoid injury.
- Gradual progression of weight being lifted to avoid injury.
- Use of spotter to assist with free weights to avoid injury.
- Recovery between sets to prevent risk of injury.
- Warm-up necessary to prepare muscles for weight lifting to avoid injury.
- Cool down necessary to reduce effects of DOMS.
- Risk assessment should be completed to ensure environment is safe and resistance machines/free weights are in good working order to avoid injury.
- PARQ has been completed to ensure client is fit and able for weight training so as to avoid injury/illness.

Award [1] for key phrase and up to [2] for explanation.

All other valid points will be given credit.

(1 × [3])

(AO1, AO2)

[3]

(ii) Answers may address some of the following points:

- Risk assessment is a technique used to prevent accidents, injuries and ill health. This process is important as it encourages the coach to think about what could go wrong prior to fitness testing and devise ways to prevent problems.
- Risk assessment is good practice and a legal requirement to complete prior to fitness testing.
- A risk assessment examines the possible hazards that may occur, the risks involved, the likelihood of them happening and how the hazards could be prevented prior to fitness testing.
- A risk assessment prior to fitness testing is important as it evaluates the safety of fitness testing equipment. Fitness testing

equipment is checked to ensure that it is in good working order and up to the specific standard for safe usage.

- A risk assessment prior to fitness testing is important as it evaluates the safety of facilities. This ensures sports halls, gyms or pitches are safe to conduct fitness testing reducing the chances of injury to participants.
- A risk assessment prior to fitness testing is important as it ensures correct fitness testing protocols are followed to protect the safety of participants.
- A risk assessment enables control measures to be put in place if a risk is identified prior to the commencement of testing.
- A risk assessment addresses the personal attire of the athlete. Clothing and footwear should be appropriate for fitness testing. Jewellery should be removed and hair should be tied back for safety.
- A risk assessment determines the appropriate fitness tests to be used for particular participants. It takes into account the physical abilities of participants and ensures the appropriate sub-maximal or maximal test is used.
- A risk assessment is important to ensure first aid is provided and that emergency procedure protocols are addressed to ensure participant needs are catered for if an accident occurs during fitness testing.
- A risk assessment provides a record of any hazards that have been identified prior to fitness testing. Actions taken to mitigate or eliminate risks should be logged and reviewed.

Award [1] for key phrase, up to [2] for explanation.

All other valid points will be given credit

(1× [3])

(AO2)

[3]

**(b)** Answer may address some of the following points:

**(i) Aerobic endurance:**

- A triathlete requires the ability of the heart and lungs to supply enough oxygen to the required muscles during physical activity for a prolonged period of time.
- Aerobic endurance is an important component of fitness for a triathlete to complete a multisport race with three continuous endurance races consisting of swimming, cycling and running. Olympic distance (swim: 1,500 m – bike: 40 km – run 10 km). Time duration 1 hr 46 min+
- Performance level is enhanced if the triathlete has the required level of aerobic endurance. The more efficient the heart and lungs the better the transport of oxygenated blood to the working muscles.
- The triathlete will be able to efficiently remove waste products from the body if they have a high  $\text{VO}_2\text{max}$  and therefore offset fatigue.
- A high level of cardiovascular endurance will enable the triathlete to reduce and cope with fatigue in order to maintain good technique.
- A high level of cardiovascular endurance will assist the triathlete in their recovery after high intensity bursts throughout the race. [3]

**(ii) Local muscular endurance:**

- A triathlete requires specific muscles or groups of muscles to make repeated contractions over a significant period of time.

- A triathlete needs local muscular endurance for the repetitive movements required in all three disciplines of swimming, running and cycling.
- A high level of local muscular endurance is required to reduce fatigue in a long distance event like the triathlon.
- Local muscular endurance is required in both the upper and lower body for open water swimming.
- Local muscular endurance is required in lower body for cycling and running.
- A high level of local muscular endurance will enhance performance and reduce times. [3]

**(iii) Flexibility:**

- A triathlete requires controlled use of the full range of motion available at a joint to allow for the full execution of the correct techniques and improve performance during the event.
- Freestyle/front crawl requires a full range of motion at the shoulder joint and a good range of motion of hip and ankle during kick.
- Cycling requires good range of motion in hip joint and running a good range of motion in shoulders, hip and knee.
- Flexibility is important for a triathlete to reduce their chances of injury.
- A high level of flexibility will increase speed and power of muscular contraction. This is important for a triathlete to perform open water swimming in strong currents and to complete high intensity bursts or sprint finish. [3]

Award [1] for key phrase, and up to [2] for the explanation.

All other valid points will be given credit.

(3 × [3])

(AO2)

[9]

**(c) (i) Answer may address some of the following points:**

- Dehydration occurs when the body loses more fluid than it is taking in. Dehydration can have the following negative effects on sporting performance:
- Glycogen stores become depleted causing fatigue/tiredness and a reduction in performance level.
- Blood becomes more viscous making it difficult to deliver oxygenated blood to working muscles so causing fatigue and a reduction in performance level.
- Overheating of the body will cause weight loss and fatigue and a reduction in performance level.
- Dehydration can cause cramps and fatigue due to loss of electrolytes and will have a negative effect on performance.
- Dehydration can cause blood pressure to drop sharply causing dizziness and likelihood of fainting which would have a negative impact on performance.

Award [1] for key phrase, and up to [2] for the explanation.

All other valid points will be given credit.

(1 × [3])

(AO2)

[3]

**(ii) Answers may address some of the following points:**

- A hydration strategy will take into account pre-exercise hydration status and fluid intake before, during and after the event. Strategies aim to replace fluids lost through exercise. Strategies will vary

between individuals and will be influenced by environmental conditions and competition regulations.

- Monitor body weight pre and post event – Drink 24 oz (1 pint and a half) for every pound lost.
- Carbohydrates, water and electrolytes (sodium, potassium, magnesium) will have been lost by the body during exercise and need to be replaced through consumption of fluids post event. Sports beverages will replace these electrolytes.
- Immediately after exercise and for the next 6–8 hours, rehydration is essential so the athlete will not begin their next event/training session dehydrated.
- Sports beverages are more effective to rehydrate the body than water alone as they contain glucose, sodium and water.
- Monitor colour of urine to establish hydration level post event and adjust fluid intake accordingly.

Award [1] for key phrase, and up to [2] for the description.

All other valid points will be given credit.

(1 × [3])

(AO2)

[3]

(d) Answers may address some of the following points:

**Carbohydrates:**

- 60–65% of total calorie intake.
- Carbohydrates best source of energy for an endurance athlete – for long-lasting energy.
- Typical examples of Complex Carbs; wholegrain pasta, rice, potatoes, fruit, cereals and veg good sources of carbohydrate that endurance athletes should incorporate into their daily diet.
- Simple Carbs glucose and fructose, sweets, fruit and sports drinks.
- Stored in muscle and liver as glycogen.
- Carbohydrates should be ingested pre, during and post exercise.

**Proteins:**

- 15% of total calorie intake.
- Protein enables the body to grow and repair muscle tissue, produce enzymes, hormones and haemoglobin.
- Protein provides energy when fat and carbohydrate stores are low.
- Typical examples: fish, dairy, eggs, veg, soya products, beans, pulses, protein shakes.

**Fats:**

- 20–30% of total calorie intake.
- Fat is an essential nutrient as it functions as our main energy source while at rest.
- Fat also supports vital organs and insulates the body.
- Fat can be used as fuel when glycogen stores run out.
- Fats can help absorption of vitamins.
- Typical examples; milk, cheese, fish, meat, breads, pastries, chocolate.
- Excess saturated fat could cause weight gain.

Award [1] for each identified food group, and up to [2] for the explanation.

(3 × [3])

(AO1, AO3)

[9]

30

**4 (a)** Answers may address the following points:**Poor diet/nutrition:**

- Increasing reliance on processed/fast food. These foods are high in fat, sugar and salt.
- General tendency to overeat/eating large portions.
- Increased food availability.
- Increased intake of sugar/fizzy drinks.
- Cost – more expensive to choose healthy food options over cheaper unhealthy food options.
- Comfort eating – a person is more likely to overeat if they have low self-esteem or feel depressed.
- Increased calorie intake through poor diet leads to weight gain/obesity.

**Positive energy balance:**

- Balance between calorie intake and energy expenditure determines a person's weight. If a person eats more calories than he/she burns through exercise and physical activity the person will have a positive energy balance, gain weight and become obese.
- Males need 2500 calories a day and women 2000 calories. Consuming more than these calories with little or no exercise will result in weight gain/obesity.
- Eating too much and moving too little will cause weight gain/obesity.

**Increased alcohol consumption:**

- People are consuming more than the recommended units of alcohol per week.
- Current guidelines recommend 14 units a week for women and men. Several drink free days in the week. Limit the total amount of alcohol in one session.
- Increasing calorie intake due to alcohol consumption leads to weight gain/obesity.

**Sedentary/inactive lifestyle:**

- Sedentary living is becoming more common. People are less active compared to previous generations. Burning less calories due to inactivity.
- Busy lifestyles – Many people work full time and due to long working hours and family commitments may have difficulty fitting activity into their lives.
- Most adults are not fulfilling recommended exercise time per week – (150 minutes a week of moderate-intensity aerobic activity e.g. complete 30 minutes of exercise 5 days a week).

**Use of transport:**

- People are less likely to walk/cycle/run to work due to availability of a range of transport options.
- People more likely to use public transport such as bus/rail or private methods such as car/taxi to travel.
- Less calories used than previous generations which can increase likelihood of weight gain/obesity.

**Popularity of passive leisure:**

- Recreation time is consumed with passive leisure activities – TV, computer games, phones, iPads, time on social media.
- Popularity of passive leisure replacing active leisure activities.
- Less calories used to increase likelihood of weight gain/obesity.

**Rise of childhood obesity levels:**

- Rise of childhood obesity levels has a direct impact on obesity levels in adulthood.
- Childhood obesity has risen due to poor diet, sedentary lifestyle, transportation, popularity of passive leisure, safety concerns playing outside, aggressive marketing to promote unhealthy food to children.
- Lack of parental knowledge relating to healthy food choices creating poor eating habits in childhood.
- Positive energy balance leading to weight gain/obesity in children.

**Genetics:**

- Some people are genetically predisposed to weight gain.
- A person is more likely to develop obesity if one or both parents are obese.
- Some genetic disorders can cause weight gain/obesity.

Award [1] for identification of reason, and up to [2] for the explanation.

All other valid points will be given credit.

(3 × [3])

(AO1, AO3)

[9]

**(b) Answers may address the following points:**

- Obesity is an increasingly common issue in Northern Ireland. It is estimated to affect 1 in 4 adults and around 1 in 5 children. Obesity among adults is as high as 27% in Northern Ireland. There has been an upward trend in obesity levels since 23% recorded in 2010. Obesity is a modern epidemic in the developed world.
- Obesity is an abnormal accumulation of body fat to the extent that it may have an adverse effect on health. A person is considered obese if their BMI is over 30.
- Obesity is a major risk factor for a number of diseases/conditions, including coronary heart disease, diabetes, cancer, stroke, osteoarthritis, sleep apnoea and high blood pressure.
- Those who are obese are also more likely to suffer psychological effects such as increased depression, social isolation, anxiety, poor body image and decreased self-esteem. These psychological factors can also lead to avoidance of physical activity and medical care.
- Poor quality of life results from obesity. Obesity is associated with shortness of breath, back pain, reduced mobility and mental health issues.
- The rise of childhood obesity levels has a direct impact on obesity levels in adulthood. If statistics continue to rise, then the unhealthy lifestyles of today's children could see them die younger than their parents. Life expectancy will decrease as a result of premature death due to obesity related diseases.
- Pressure on the NHS (National Health Service). Increased health care costs. NHS Budget has to meet the demand of the costs related to obesity related diseases. Money has to be spent on medical staff, care and prescription drugs related to obesity. Reliance on medical treatment and medication is greater thus adding to economic costs.
- Increased benefit payments and social care costs on the rise as a result of people being unable to work as a result of obesity related disease.
- Social costs to local authorities for the care of housebound residents suffering from obesity related illness is on the increase.
- Absenteeism increases and less productive workforce. Less productivity can negatively affect economic output.
- Government needs to act to make strategic plans to deal with an inactive and overweight population.

- Changing adult behaviour could save NHS time and money. Changeable behaviours include diet, exercise, stop smoking, reduce alcohol intake and drug abuse.
- Department of health must invest resources into educating the population to change adult behaviours. Childhood eating habits can also improve through educating parents on healthy lifestyle choices.

All other valid points will be given credit.

### Level 1 ([1]–[3])

#### Overall impression: Basic

- Basic knowledge and understanding of the implications for today's society in Northern Ireland of rising obesity levels. The candidate may include basic examples.
- Demonstrates a basic ability to analyse the implications for today's society in Northern Ireland of rising obesity levels. Candidate will give basic explanations.
- Quality of written communication is basic. The candidate makes a limited selection and use of appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialised vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear.

### Level 2 ([4]–[6])

#### Overall impression: Good

- Good knowledge and understanding of the implications for today's society in Northern Ireland of rising obesity levels. The candidate will provide relevant examples.
- Demonstrates a good ability to analyse the implications for today's society in Northern Ireland of rising obesity levels. The candidate will provide relevant explanations, using specific examples.
- Quality of written communication is good. The candidate makes a reasonable selection and use of appropriate form and style of writing. Relevant material is organised with some clarity and coherence. There is adequate use of specialised vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning clear.

### Level 3 ([7]–[8])

#### Overall impression: Excellent

- Excellent knowledge and understanding of the implications for today's society in Northern Ireland of rising obesity levels. The candidate will provide fully developed examples and show excellent understanding.
- Demonstrates an excellent ability to analyse the implications for today's society in Northern Ireland of rising obesity levels. The candidate will provide thorough explanation and will use a variety of relevant examples.
- Quality of written communication is excellent. The candidate successfully selects and uses an appropriate form and style of writing. Relevant material is organised with a degree of clarity and coherence. There is extensive and accurate use of specialist vocabulary. Presentation, spelling, punctuation and grammar are of a high standard and ensure meaning is clear.

[0] is awarded for a response not worthy of credit

(AO1, AO3)

[8]

17

5 (a) Answers may address some of the following points:

- Allows physiological adaptations – tissue repair and hypertrophy of muscle occurs during rest and recovery in order to increase strength and enhance performance.
- Allows restoration of energy stores – phosphocreatine, glycogen stores to pre-exercise levels. This will enhance performance.
- Reduces physical fatigue – recovery sessions will help remove deoxygenated blood and lactic acid from the muscles to reduce fatigue and improve performance.
- Reduces mental/psychological fatigue – the athlete will be able to take more coaching points on board, have improved alertness and concentration levels as a result of rest and recovery.
- Reduces stress – sleep and recovery will prevent fluctuation of hormone levels – cortisol and HGH. Athlete will enjoy their training programme and maximise their performance level.
- Reduces chances of injury – rest and recovery is crucial to prevent tightening of muscles/muscle tears.
- Prevents overtraining when an athlete feels stale, performance level has decreased and injury may have occurred.
- Prevents burn-out which is physical/emotional exhaustion, sport devaluation and reduced performance level in sport.

Award [1] for the key phrase and [1] for the explanation.

(2 × [2])

(AO2)

[4]

(b) **The quality of written communication is assessed in this question.**

Answers may address some of the following points:

**Active Static Stretching:**

- Definition: Active static stretching can be achieved actively by a gymnast moving into a position that takes the joint beyond its point of resistance, lengthening the soft tissue around the joint.
- A voluntary muscular contraction occurs. The position is held for at least 10 seconds. Can be held up to 30–60 seconds.
- The intensity of this type of stretching can be measured by the length of time the client is able to hold the stretch.
- Active static stretching will improve joint mobility and flexibility.
- Improve the execution of gymnastic skills due to greater range of motion around the joints.
- Improve speed and power of muscular contraction.
- Can be a good introduction to more progressive stretching methods such as PNF stretching within a flexibility session.
- It is a safe method as the gymnast is in control of the intensity and duration of the stretch.
- No dynamic movement, which may not prepare a gymnast fully for execution of skills.
- Least likely stretches to cause injury.

**Passive Static Stretching:**

- Definition: Passive static stretching requires the joint to move beyond the point of resistance, lengthening the soft tissue around the joint. This method uses an external force such as a partner/wall to move the joint beyond the point of resistance and holds the position. Also known as assisted stretching.
- Passive static stretching will improve joint mobility and flexibility.
- Improve the execution of gymnastic skills due to greater range of motion around the joints.
- Improve speed and power of muscular contraction.
- Greater stretch can be achieved compared to active static stretching due to help of partner/external force.
- A gymnast will have a high base level of flexibility therefore will be able to manage an external force controlling the stretch.
- Greater likelihood of injury.

**Dynamic Stretching:**

- Definition: Dynamic stretching is another form of stretching and it is where the muscle is stretched through a range of controlled movements. Dynamic stretching is a form of active movement that takes the athlete's body through a range of motion to prepare for workout or sporting activity. Dynamic stretching does not concentrate on stretching one single muscle, but rather to simulate movements that are important for a certain activity or sports. Examples of dynamic stretching are controlled movement into and out of stretches, e.g. standing hamstring stretch lowering arms and movement into other leg.
- Dynamic stretching will improve joint mobility and flexibility.
- Improve the execution of gymnastic skills due to greater range of motion around the joints.
- Improve speed and power of muscular contraction.
- A gymnast will have a high base level of flexibility therefore will be able to manage greater demands of dynamic stretching.
- Important for gymnasts to perform dynamic stretching as it is a sport that requires high speed movements and movements that take a muscle/joint past its normal range of movement.
- Better psychologically prepared for competition.
- Dynamic stretching will also improve mobility as well as flexibility.
- Greater likelihood of injury.

**Ballistic Stretching:**

- Definition: Ballistic stretching uses momentum to move a body part through its extreme range of movement. The flexibility exercises involve swinging or bouncing movements, e.g. torso turns, arm swings, bouncing or bobbing actions.
- Ballistic stretching will improve joint mobility and flexibility.
- Improve the execution of gymnastic skills due to greater range of motion around the joints.
- Improve speed and power of muscular contraction.
- A gymnast will have a high base level of flexibility therefore will be able to manage greater demands of ballistic stretching.
- Research shown effective improvement in flexibility as a result of ballistic stretching.
- Effective method to prepare muscles for high impact activity in gymnastics, e.g. parallel bars.
- The body gets pushed beyond its comfort zone, ideal for physically intensive activities.
- Enhances motor performance of the muscles.
- Greater likelihood of injury.

**Proprioceptive neuromuscular facilitation (PNF) stretching:**

- Definition: The gymnast moves the joint to just beyond its resistance point and then performs an isometric contraction (a partner/apparatus can be used to provide the resistance) for 6–10 seconds. The muscle is relaxed and stretched again, and will usually stretch further a second time.
- PNF stretching will improve joint mobility and flexibility.
- Improve the execution of gymnastic skills due to greater range of motion around the joints.
- Improve speed and power of muscular contraction.
- A gymnast will have a high base level of flexibility therefore will be able to manage greater demands of PNF stretching.
- The second stretch stimulates the Golgi Tendon organ (GTO) response which causes further relaxation of the muscle and enabling further stretching of the muscle with the aid of a partner.
- PNF stretching relies on the fact that a muscle performs an isometric contraction when stretched, the stretch reflex mechanism of the muscle spindles is switched off, and therefore enables the muscle to stretch further than previously.
- It is a combination of passive stretching and static stretching in order to achieve maximum flexibility.
- Most effective method of increasing muscle elasticity and flexibility.
- Greater likelihood of injury.

All other valid points will be given credit.

**Level 1 ([1]–[4])****Overall impression: Basic**

- Basic knowledge and understanding of flexibility training methods. The candidate may include basic examples.
- Demonstrates a basic ability to analyse flexibility training methods used by a gymnast. Candidate will give basic explanations.
- Quality of written communication is basic. The candidate makes a limited selection and use of appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialised vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear.

**Level 2 ([5]–[7])****Overall impression: Good**

- Good knowledge and understanding of flexibility training methods. The candidate will provide relevant examples.
- Demonstrates a good ability to analyse flexibility training methods used by a gymnast. The candidate will provide relevant explanations, using specific examples.
- Quality of written communication is good. The candidate makes a reasonable selection and use of appropriate form and style of writing. Relevant material is organised with some clarity and coherence. There is adequate use of specialised vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning clear.

**Level 3 ([8]–[10])**

**Overall impression: Excellent**

- Excellent knowledge and understanding of flexibility training methods. The candidate will provide fully developed examples and show excellent understanding.
- Demonstrates an excellent ability to analyse flexibility training methods used by a gymnast. The candidate will provide thorough explanation and will use a variety of relevant examples.
- Quality of written communication is excellent. The candidate successfully selects and uses an appropriate form and style of writing. Relevant material is organised with a degree of clarity and coherence. There is extensive and accurate use of specialist vocabulary. Presentation, spelling, punctuation and grammar are of a high standard and ensure meaning is clear.

[0] is awarded for a response not worthy of credit

(AO1, AO3)

[10]

14

**Total**

**100**

**AVAILABLE  
MARKS**