Mark Scheme

2017

Pearson BTEC Level 3 –
Health & Social Care

Additional sample assessment material

Unit 3: Anatomy and Physiology for
Health and Social Care (31493H)

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Unit 3: Anatomy and physiology for Health and Social Care

General marking guidance

- All learners must receive the same treatment. Examiners must mark the first learner in exactly the same way as they mark the last.
- Marking grids should be applied positively. Learners must be rewarded for what they have shown they can do, rather than be penalised for omissions.
- Examiners should mark according to the marking grid, not according to their perception of where the grade boundaries may lie.
- All marks on the marking grid should be used appropriately.
- All the marks on the marking grid are designed to be awarded. Examiners should always award full marks if deserved. Examiners should also be prepared to award zero marks, if the learner's response is not rewardable according to the marking grid.
- Where judgement is required, a marking grid will provide the principles by which marks will be awarded.
- When examiners are in doubt regarding the application of the marking grid to a learner's response, a senior examiner should be consulted.

Specific marking guidance

The marking grids have been designed to assess learner work holistically. Rows in the grids identify the assessment focus/outcome being targeted. When using a marking grid, the 'best fit' approach should be used.

- Examiners should first make a holistic judgement on which band most closely matches the learner's response and place it within that band. Learners will be placed in the band that best describes their answer.

- The mark awarded within the band will be decided based on the quality of the answer, in response to the assessment focus/outcome and will be modified according to how securely all bullet points are displayed at that band.

- Marks will be awarded towards the top or bottom of that band, depending on how they have evidenced each of the descriptor bullet points.

BTEC Next Generation Mark Scheme

Unit 3: anatomy and physiology for Health and Social Care

Question Number	Answer	Mark
1ai	Award **one** mark for each correct role to a maximum of **two** marks. **Gastric sphincter**: prevent reflux; (1). **Pancreas**: produces digestive enzymes/insulin / glucagon); (1). Accept any other appropriate wording.	2

Question Number	Answer	Mark
1aii	Award **one** mark for the identification, **one** mark for the expansion to a maximum of **two** marks. Muscular contractions (1) that move food along the digestive tract (1). Accept any other appropriate wording.	2

Question Number	Answer	Mark
1 bi	Award one mark for the identification, one mark for the expansion to a maximum of two Auto-immune disease (1). Reaction to gluten in food (1). Accept any other appropriate wording.	2

Question Number	Answer	Mark
1 bii	Award one mark for the identification, one mark for the expansion to a maximum of **two** marks. Coeliac disease leads to bloating (1), this causes pain in abdomen /often with diarrhoea /can lead to malnutrition as nutrients not absorbed effectively (1). Accept any other relevant phrasing/wording.	2

Question Number	Answer	Mark
1ci	Storage of bile (1). Do not accept production of bile.	1

Question Number	Answer	Mark
2a	Award **one** mark for the identification and **one** additional mark for the appropriate expansion to a maximum of **four** marks. Locomotion (1) as hinged at knee/hip (1). Source of erythrocytes (1) as produced in marrow (1). Support (1) as attachment for major muscles (1). Accept any other relevant phrasing/wording.	4

Question number	Indicative content
2b	Calcium loss from bones. Can be caused by hormone related conditions e.g. Cushing's. It can also be caused by excessive exercise and dieting. In women, the causes can be low oestrogen levels, the menopause or a hysterectomy. In men, the causes can be low testosterone levels and/or hypogonadism. The effect is a loss of bone density that can lead to an increased chanced of fractures, a stooping posture, and pain.

Mark scheme (award up to 6 marks) refer to the guidance on the cover of this document for how to apply levels-based mark schemes*.

Level	Mark	Descriptor
Level 0	0	No rewardable material.
Level 1	1–2	• Demonstrates isolated elements of knowledge and understanding. • Provides little or no reference causes of osteoporosis • Generic statements may be presented, rather than linked factors/components being identified and explored in the context of the skeletal system. Limited attempt to address the question. • Response is likely to lack clarity, organisation and the required technical language.

Level	Mark	Descriptor
Level 2	3–4	• Demonstrates accurate knowledge and understanding. • References to cause and effect of osteoporosis are present. • Learners will identify linked factors/components, with some development in the form of mostly accurate and relevant factual material. The accuracy in the detail on the factors identified is likely to vary. • The response may contain parts that lack clarity or proper organisation. Evidence of correct technical language being used.
Level 3	5–6	• Demonstrates accurate knowledge and understanding. • Sustained coverage of cause and effect of osteoporosis • Might demonstrate the ability to integrate and synthesise relevant information about the skeletal system. • A contextualised analysis of the cause and effect of osteoporosis is developed using mostly coherent chains of reasoning, leading to a range of factors/components being present. • Learners will demonstrate understanding of linkages and relationships between/within systems. • Response demonstrates good organisation, clarity and use of technical language.

Question Number	Answer	Mark
3a	Award **one** mark for the identification and **2** additional marks for the appropriate expansion to a maximum of **three** marks. Release of energy (1). By producing ATP from ADP (1). ATP acts as an 'energy store' for the cell (1). Accept any other relevant phrasing/wording.	3

Question Number	Answer	Mark
3b	Any **four** points from the following list, must link correctly, and in the correct order. DNA in nucleus (1) triplets are a code (1). Transcription (1) produces Mrna (1). This is translated (1) by ribosomes in cytoplasm (1). tRNA (1) matches amino acids (1) proteins are formed of amino acids (1). Rough endoplasmic reticulum (1). Golgi apparatus (1).	4

Question Number	Answer	Mark
4ai	Award **one** mark for each point to a maximum of **two** marks. Ductless gland (1) produces hormones directly into bloodstream (1).	2

Question Number	Answer	Mark
4aii	**One** mark for any of the following: Pituitary gland. Pineal gland. Hypothalamus. Thyroid gland. Parathyroid glands. Adrenal glands. Ovaries Testes.	1

Question number	Indicative content
4bi	No insulin is produced by the pancreas. So, no sugar stored as glycogen in the liver and muscles. Any excess sugar is excreted, so producing sugar in the urine. When energy requirements rise no sugar is available. Because there is no sugar available the body uses fat and protein as an energy source. This leads to 'wasting' and weight loss, including a loss of muscle mass Ketones are detected on the breath due to protein digestion.

Mark scheme (award up to 6 marks) refer to the guidance on the cover of this document for how to apply levels-based mark schemes*.

Level	Mark	Descriptor
Level 0	0	No rewardable material.
Level 1	1–2	• Demonstrates isolated elements of knowledge and understanding. • Provides little or no reference to effects of type 1 diabetes • Generic statements may be presented, rather than linked factors/components being identified and explored in the context of the endocrine system. • Limited attempt to address the question. • Response is likely to lack clarity, organisation and the required technical language.

Level	Mark	Descriptor
Level 2	3–4	• Demonstrates accurate knowledge and understanding. • References to effects of type 1 diabetes are present. • Learners will identify linked factors/components, with some development in the form of mostly accurate and relevant factual material. The accuracy in the detail on the factors identified is likely to vary. • The response may contain parts that lack clarity or proper organisation. Evidence of correct technical language being used.
Level 3	5–6	• Demonstrates accurate knowledge and understanding. • Sustained coverage of effects of type 1 diabetes • Might demonstrate the ability to integrate and synthesise relevant information about the endocrine system. • A contextualised analysis of the cause and effect of diabetes 1 is developed using mostly coherent chains of reasoning • Learners will demonstrate understanding of linkages and relationships between/within systems. • Response demonstrates good organisation, clarity and use of technical language.

	Answer	Mark
4bii	Award **one** mark for each point to a maximum of **two** for type 1 diabetes and a maximum of **two** for type 2 diabetes to an overall maximum of **four** marks. • No insulin produced in type 1 diabetes (1). • In type II diabetes, the body does not respond to insulin (1). • Type II diabetes can either be the result of lifestyle or genetic factors (1). • Type 1 is not caused by lifestyle (1). • Type 1 is early onset and Type II is late onset (1). Accept alternative wording.	4

	Answer	Mark
4c	Award **one** mark for the identification and **one** additional mark for the appropriate expansion to a maximum of **four** marks. Glucose damages capillaries (1) which can lead to bleeding in the retina /blindness can result (1). Blood supply to limbs reduced (1) making infections difficult to fight/leading to gangrene/amputation (1). Heart muscle degenerates due to reduced blood supply (1) leading to an increased chance of heart disease (1). Accept any other valid response.	4

	Answer	Mark
5ai	Award **one** mark for the identification and **one** additional mark for the appropriate expansion to a maximum of **four** marks. **Back:** • Erector spinae. • Deltoids. • Trapezius. • Latissimus dorsi. **Abdomen:** • Erectus abdominis. • Internal and external obliques. **Arm:** • Biceps brachii. • Triceps brachii. **Chest:** • Pectoralis major. **Buttock:** • Gluteus maximus. **Thigh/Leg:** • Semimembranosus. • Semitendinosus. **Leg:** • Biceps femoris. • Adductors. • Rectus femoris. • Vastus lateralis. • Vastus medialis. • Vastus intermedius. • Tibialis anterior. • Gastrocnemius. • Soleus.	4

	Answer	Mark
5aii	Award **one** mark for the identification and **one** additional mark for the appropriate expansion to a maximum of **four** marks. Tendons (1) attach bone to muscle (1). Fascia (1) surround muscle (1).	4

	Answer	Mark
5b	Award **one** mark for each point to a maximum of **two** for synovial joints and a maximum of **two** for fibrous joints to an overall maximum of **four** marks. Both connect bones (1) but synovial joints have a space between the bones (1). Fibrous are immovable (1) synovial freely movable (1). Fibrous held together by collagen (1) synovial held together by ligaments (1). Accept any other relevant phrasing/wording.	4

Question number	Indicative content
5c	The nervous system works with the musculoskeletal system. The nervous system reacts to CO2 levels in the circulatory system as CO_2 receptors on brain initiate messages. The circulatory system brings CO2 from the muscles. Signals sent to the intercostal muscles and diaphragm to contract. Messages cause the change of shape of diaphragm as it contracts/relaxes Contraction of diaphragm causes inhalation. Relaxation of diaphragm causes exhalation. Contraction of intercostal muscles raises ribs in inhalation. Relaxation of intercostal muscles drops ribs in exhalation. There is an increase of volume of thorax in inhalation. There is a decrease of volume of thorax in exhalation.

Mark scheme (award up to 8 marks) refer to the guidance on the cover of this document for how to apply levels-based mark schemes*.

Level	Mark	Descriptor
Level 0	0	No rewardable material.
Level 1	1–2	• Demonstrates isolated elements of knowledge and understanding. • Provides little or no reference to relevant interrelationships of body systems. • Generic statements may be presented, rather than linked factors/components being identified and explored in the context of ventilation. Limited attempt to address the question. • Response is likely to lack clarity, organisation and the required technical language.
Level	Mark	Descriptor
Level 2	3–5	• Demonstrates accurate knowledge and understanding. • References to relevant interrelationships of body systems. • are present. • Learners will identify linked factors/components, with some development in the form of mostly accurate and relevant factual material, leading to an analysis of ventilation in the context being presented. The accuracy in the detail on the factors identified is likely to vary. • The response may contain parts that lack clarity or proper organisation. Evidence of correct technical language being used.
Level 3	6–8	• Demonstrates accurate knowledge and understanding. • Sustained coverage of relevant interrelationships of body system is present. Might demonstrate the ability to integrate and synthesise relevant information about ventilation • A contextualised analysis of ventilation is developed using mostly coherent chains of reasoning, leading to a range of factors/components being present. Learners will demonstrate understanding of linkages and relationships between/within systems. • Response demonstrates good organisation, clarity and use of technical language.

	Answer	Mark
6ai	Award **one** mark for the identification, up to **two** for the appropriate expansion to a total of **three** marks. Cause of death is recorded on the death certificate (1). By a registered medical practitioner (1). Collated centrally by the Office for National Statistics (1). Accept any other relevant phrasing/wording	3

	Answer	Mark
6aii	Award **one** mark for the identification and **one** additional mark for the appropriate expansion to a maximum of **four** marks. Records of causes of illness are collected by sampling GP records (1) this is used to inform research (1). The general household survey collects information (1) that is used to direct resources (1). Accept any other appropriate response.	4

	Answer	Mark
6aiii	Award **one** mark for each identification to no more than **three** and up to **five** additional marks for appropriate expansions to a maximum of **six** marks. Mortality rates allow professionals to identify the prevalent causes of death in the population (1). They can relate this to the causal factors (1). Identifies changes in causes of death (1). Links made to changes in lifestyle choices (1). Judgements can be made about the effect of changes in lifestyle choices (1). Accept any other appropriate response.	6

Question number	Indicative content
6b	Mortality statistics record death rates. Morbidity statistics record disease rates. Mortality statistics don't always reflect underlying and contributing disorders. Mortality statistics are collected from death certificates – accurate as all deaths are recorded. Morbidity sampled from GPs/household survey etc. therefore more likely to contain inaccuracies. Mortality is retrospective - might be out of date. Morbidity allows targeted responses.

Mark scheme (award up to 8 marks) refer to the guidance on the cover of this document for how to apply levels-based mark schemes*.

Level	Mark	Descriptor
Level 0	0	No rewardable material.
Level 1	1–2	• Demonstrates isolated elements of knowledge and understanding. • Provides little or no reference to relevant comparisons of statistics • Generic statements may be presented, rather than linked factors/components being identified and explored in the context of ventilation. Limited attempt to address the question. • Response is likely to lack clarity, organisation and the required technical language.

Level	Mark	Descriptor
Level 2	3–5	• Demonstrates accurate knowledge and understanding. • References to relevant comparisons of statistics are present • Learners will identify linked factors/components, with some development in the form of mostly accurate and relevant factual material, leading to an analysis of ventilation in the context being presented. • The accuracy in the detail on the features identified is likely to vary. • The response may contain parts that lack clarity or proper organisation. Evidence of correct technical language being used.
Level 3	6–8	• Demonstrates accurate knowledge and understanding. • Sustained coverage of relevant comparisons of statistics is present. Might demonstrate the ability to integrate and synthesise relevant information about statistics • A contextualised comparison of statistics is developed using mostly coherent chains of reasoning, leading to a range of factors/components being present. • Learners will demonstrate understanding of linkages and relationships between types of statistics. • Response demonstrates good organisation, clarity and use of technical language.

	Answer	Mark
7	Award **one** mark for each point and correct working to a total of **eight** marks. The probability of diabetic mother is 7.5 % (1). 19478/257715x100 (1). The probability of a diabetic father is 7.9% (1). 20057/25771x100 (1). The probability of both parents being diabetic is 1% (1). 2754/25771x100 (1). Neither parent diabetic 83.6 % (1). 100-(7.5+7.9+1) (1). Accept any there correct working or method	8

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