



Mark Scheme (Results)

June 2019

BTEC Level 3 Nationals
Health and Social Care

Unit 3: Anatomy and Physiology for
Health and Social Care

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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

Health and Social Care Unit 3 – 1906

Question Number	Answer	Mark
1(a)	Award one mark for any of the following to a maximum of two marks. Striated/skeletal (1). Non-striated/smooth (1). Cardiac (1).	2

Question Number	Answer	Mark
1 (b)	Award one mark for the identification and one additional mark for the appropriate expansion to a maximum of four marks. <ul style="list-style-type: none">- Cartilage (1) protection/soft structures/shock absorber/joins bones (1).- Bone (1) support/production of blood cells/protection (1).- Adipose (1) insulation/protection (1).- Areolar (1) connects organs and tissues (1). Do not accept blood . Accept any other valid wording.	4

Question Number	Answer	Mark
1 (c)	<p>Award one mark for the identification and one additional mark for the appropriate expansion to a maximum of four marks.</p> <p>Transport oxygen (1) in red blood cells/as oxyhaemoglobin/to allow the cells to respire (1).</p> <p>Transport carbon dioxide (1) in solution in the plasma/to remove from the body (1).</p> <p>Contains white blood cells/lymphocytes (1) that enable the immune response/fight germs (1).</p> <p>Contains platelets (1) that cause clotting in wounds (1).</p> <p>Transports heat (1) to ensure the extremities are kept warm (1).</p> <p>Carries hormones (1) to target organs (1).</p> <p>Transports nutrients (accept accurate examples to a maximum of 1 mark) (1) for energy/growth/repair (1).</p> <p>Transport waste products (1) to remove from the body (1).</p> <p>Accept any other valid response.</p>	4

Question Number	Answer	Mark
2 (a)	<ul style="list-style-type: none"> • A - Kidney • B - Ureter <p>Do not accept urethra.</p>	2

Question Number	Answer	Mark
2 (b)	<p>Award one mark for the identification and one additional mark for the appropriate expansion to a maximum of four marks.</p> <p>Urethra Takes urine from the bladder (1) then ejects it externally/then out of the body (1).</p> <p>Takes semen from the prostate/testicles (1) to the penis (1).</p> <p>Bladder Stores urine (1) produced by the kidneys/so it can be released later/until it is excreted (1).</p> <p>Accept any other relevant phrasing/wording.</p>	4

Question Number	Answer	Mark
2 (c)	<p>Award one mark for the identification to a total of two and one additional mark for the appropriate expansion to a maximum of two, giving a total of four marks.</p> <p>Organ failure (1) as toxins build up in the blood (1).</p> <p>Kidneys stop filtering the blood (1) so waste products build up in the body/blood (1).</p> <p>Excessive urination (1) due to failure of osmoregulation (1).</p> <p>Dehydration (1) due to increased urination (1).</p> <p>Swelling/oedema (1) due to decreased urination (1).</p> <p>High levels of urea in the blood (1) cause vomiting/diarrhoea (1).</p> <p>Swelling/oedema (1) due to retention of fluids/failure of the glomerulus (1).</p> <p>Breathing problems (1) due to excessive fluid in body (1).</p> <p>Accept any other valid response. Accept any other appropriate wording.</p>	4

Question Number	Answer	Mark
3a	<p>Award one mark for each identification to a maximum of two and one additional mark for each appropriate expansion to a maximum of two, giving a total of four marks.</p> <ul style="list-style-type: none"> • Support (1) by providing a rigid structure (1). • Protection (1) by providing a rigid cover for organs (1). • Attachment point for muscles (1) to function/to allow movement (1). • Blood cell production (1) in the marrow (1). • Mineral store (1) for example calcium (1). <p>Accept any other valid response and specific examples.</p>	4

Question Number	Answer	Mark
3b	<p>Award one mark for each point to a maximum of four marks. Do not award more than three marks for each joint type.</p> <p>Both joints connect bones (1).</p> <p>Fibrous joints joined by fibrous tissue (1).</p> <p>Fibrous joints are found in e.g. the skull/pelvis etc. (accept specific correct examples) (1).</p> <p>Fibrous joints have no or very limited movement (1).</p> <p>Cartilaginous joints protected by cartilage (1).</p> <p>Cartilaginous joints are joined by ligaments (1).</p> <p>Cartilaginous joints are e.g. knee/elbow/shoulder/vertebrae (accept specific correct examples) (1).</p> <p>Cartilaginous joints allow some/more movement (1).</p> <p>Do not accept absence of a structure/function.</p> <p>Accept any other relevant phrasing/wording.</p>	4

Question Number	Answer	Mark
3c	<p>Award one mark for the identification and one additional mark for the appropriate expansions to a maximum of four marks.</p> <p>Lubrication (1) to prevent the joint rubbing/overheating (1).</p> <p>Reduces friction (1) to reduce pain/protect the joint (1).</p> <p>Shock absorption (1) to reduce damage to the joint ends/development of arthritis (1).</p> <p>Contains nutrients (1) that maintain the cartilage (1).</p> <p>Provides additional protection (1) after injury (1).</p> <p>Accept any other relevant phrasing/wording.</p>	4

Question Number	Indicative content
3 (d)	<p>Responses may include the following:</p> <ul style="list-style-type: none"> • Inability to move due to loss of stability. • Pain due to damaged nerves. • Bleeding from femoral artery/blood rich marrow, because sharp pieces of bone cut the artery. • Deformity due to large muscle contracting and pulling the broken bone out of place. • Infections due to exposed bone fragments in compound fractures.

Level	Mark	Descriptor
Level 0	0	No rewardable material.
Level 1	1-2	<ul style="list-style-type: none"> • Demonstrates isolated elements of knowledge and understanding. • Generic statements may be presented rather than linkages being made. • Lines of reasoning are unsupported.
Level 2	3-4	<ul style="list-style-type: none"> • Demonstrates mostly accurate knowledge and understanding. • Answers evidences occasional linkages among the elements in the context of the question. • Lines of reasoning occasionally supported through the application of recent evidence.
Level 3	5-6	<ul style="list-style-type: none"> • Demonstrates accurate and thorough knowledge and understanding. • Answer evidences comprehensive linkages among the elements in the context of the question. • Lines of reasoning supported throughout by sustained application of relevant evidence.

Question Number	Answer	Mark
4 (a)	<p>Award one mark for identification and one additional mark for appropriate expansion.</p> <p>Controls involuntary nervous system (1)</p> <p>Controls body temperature (1)</p> <p>Stimulates other glands (1)</p> <p>Produces hormones (1)</p> <p>ADH, (1) LH (1), FSH(1), growth hormones, (1) TSH, (1) prolactin, (1)</p> <p>Control body functions (1)</p> <p>Control of growth (1)</p> <p>controls sex organs/menstruation (1)</p> <p>Stimulates secondary sexual characteristics (1)</p> <p>Osmoregulation (1)</p> <p>Do not accept 'produces hormones' in addition to specified hormones.</p> <p>Accept any other appropriate answers.</p>	2

Question Number	Answer	Mark
4 (b)	<p>Award one mark for the appropriate linked descriptions to a maximum of four marks.</p> <p>Controls the flight or fight response (1).</p> <p>Increases blood flow to the muscles (1).</p> <p>Vasodilation (1)</p> <p>Increases the output of the heart (1).</p> <p>Causes pupil dilation (1).</p> <p>Increases blood sugar levels (1).</p> <p>Increases ventilation/breathing rate (1).</p> <p>Heightened senses (1)</p> <p>Reduce pain sensations (1)</p> <p>Results in an increased oxygen supply (1)</p> <p>Increased energy levels (1)</p> <p>Increased reaction times (1)</p> <p>Nausea/fatigue/tremors as an aftereffect (1)</p> <p>Accept any other relevant phrasing/wording.</p>	4

Question Number	Indicative content
4 (c)	<p>Responses may include the following:</p> <ul style="list-style-type: none"> • Caused by a reduced level of thyroxin/underactive thyroid. • Thyroxin is produced in the thyroid gland. • Thyroxin controls metabolic rate. • The reduced metabolic rate can lead to the following symptoms: <ul style="list-style-type: none"> ○ Lethargy ○ Weight gain ○ Cold sensitive ○ Carpal tunnel syndrome ○ Depression and memory problems. • It can lead to cardiovascular disease/high cholesterol. • Extreme cases develop a goitre and ultimately coma. • Treatment includes thyroxin replacement.

Level	Mark	Descriptor
Level 0	0	No rewardable material.
Level 1	1-2	<ul style="list-style-type: none"> • Demonstrates isolated elements of knowledge and understanding. • Generic statements may be presented rather than linkages being made. • Lines of reasoning are unsupported.
Level 2	3-4	<ul style="list-style-type: none"> • Demonstrates mostly accurate knowledge and understanding. • Answers evidences occasional linkages among the elements in the context of the question. • Lines of reasoning occasionally supported through the application of recent evidence.
Level 3	5-6	<ul style="list-style-type: none"> • Demonstrates accurate and thorough knowledge and understanding. • Answer evidences comprehensive linkages among the elements in the context of the question. • Lines of reasoning supported throughout by sustained application of relevant evidence.

Question Number	Answer	Mark
5 (a)	<p>Award one mark for identification and one additional mark for appropriate expansion.</p> <p>Transfer air/oxygen (1) to the respiratory system (1)</p> <p>Transfer carbon dioxide (1) from the respiratory system (1)</p> <p>Filtering out bacteria (1) to prevent infection (1).</p> <p>Has a good blood supply (1) to warm the air (1).</p> <p>Contains hairs/mucus (1) that trap foreign bodies (1).</p> <p>Contains ciliated cells (1) that remove the trapped foreign bodies (1).</p> <p>Accept any other relevant phrasing/wording.</p>	2

Question Number	Answer	Mark
5 (b)	<p>Award one mark for identifying the function and one mark for each descriptive point to a maximum of four marks.</p> <p>They are small air sacs (1)</p> <p>The function is gas exchange (1).</p> <p>Oxygen/carbon dioxide diffuse across the membrane (1)</p> <p>The alveoli have a large surface area (1).</p> <p>There is a good blood supply to the alveolar membrane (1).</p> <p>The surface is moist (1).</p> <p>Thin membrane/simple epithelium tissue (1)</p> <p>Accept any other valid response.</p>	4

Question Number	Answer	Mark
5 (c)	<p>Award one mark for the identification to a maximum of two and one additional mark for each appropriate expansion to a maximum of four marks.</p> <p>The intercostal muscles contract (1), lifting the ribcage (1) increasing the volume of the thorax (1) causing inhalation (1)</p> <p>The intercostal muscles relax (1), dropping the ribcage (1) decreasing the volume of the thorax (1) causing exhalation (1)</p> <p>The diaphragm contracts (1) and pulls down (1) decreasing pressure in the lungs (1) and air enters (1)</p> <p>The diaphragm relaxes (1) and pushes up (1) increasing pressure in the lungs (1) and air exits (1)</p> <p>Where points are linked, the interrelationships must be accurate. Accept any other relevant phrasing/wording.</p>	4

Question Number	Indicative content
5 (d)	<p>Responses may include the following:</p> <ul style="list-style-type: none"> • Tar prevents cilia moving, leading to increased infections. • This can lead to COPD, which is a group of diseases that affect the lungs. • Increased chance of pneumonia/bronchitis/emphysema. • Nicotine causes vasoconstriction, affecting the circulatory system, putting pressure on the respiratory system. • Increased risk of cancer of the lungs. • Carbon monoxide decreases the efficiency of the blood to carry oxygen. • Cancer can also affect other structures in the respiratory system, e.g. the larynx, mouth and nose. • It can exacerbate asthma. • Increased chance of cardiovascular disease.

Level	Mark	Descriptor
Level 0	0	No rewardable material.
Level 1	1-2	<ul style="list-style-type: none"> • Demonstrates limited and superficial knowledge and understanding of the relevant factors/issues • Partial attempt to deconstruct information and apply their understanding to the context • Unbalanced or generic judgements are made with limited support of evidence.
Level 2	3-5	<ul style="list-style-type: none"> • Demonstrates generally accurate knowledge and understanding of the relevant factors/issues • Deconstructs information leading to some coherent and logical chains of reasoning which shows generally sound application of their understanding to the context • Constructs judgements of some of the elements in the question. Judgements are supported by appraisal of evidence but this is likely to be imbalanced.
Level 3	6-8	<ul style="list-style-type: none"> • Demonstrates accurate and thorough knowledge and understanding of the relevant factors/issues • Deconstructs information in the context leading to fully coherent and logical chains of reasoning which shows fully sound application of their understanding to the context • Constructs coherent and reasoned judgements of the full range of elements in the question. Judgements are fully supported by the comprehensive and balanced appraisal of evidence.

Question Number	Answer	Mark
6 (a)	<p>Award one mark each descriptive point to a maximum of four marks (award a maximum of three marks for a one sided answer).</p> <p>Least deprived has gone from about 1000 to about 1300 (1).</p> <p>Most deprived has risen from about 2,500 to about 3000 (1).</p> <p>So least deprived has increased by about 300 (1).</p> <p>Most deprived has increased by about 500 (1).</p> <p>Least deprived has increased by about 30% (1).</p> <p>Most deprived has increased by about 20% (1).</p> <p>There is an increase in both (1)</p> <p>People from deprived areas more likely to get copd/higher rate (1)</p> <p>In deprived areas the rate increased towards the end (1).</p> <p>In the least deprived areas the higher rate is at the start (1).</p> <p>Accept any other valid response.</p>	4

Question Number	Answer	Mark
6 (b)	<p>Award one mark for each identification to a maximum of two and one additional mark for the appropriate expansion to a maximum of four marks.</p> <p>Older people have smoked for longer (1) smoking can cause COPD (1) the reduced oxygen levels (1) have caused organ failure (1)</p> <p>An effect of ageing is a reduced immune response/vulnerability to degenerative diseases (1) making older people more vulnerable to infections (1) people with COPD are more vulnerable to respiratory infections (1) these infections can be fatal (1)</p> <p>Older people were more likely to work in 'dirty' industries (1) exposing them to dust/chemicals that can cause COPD (1).</p> <p>Accept any other valid response.</p>	4

Question Number	Indicative content
6 (c)	<p>Responses may include the following:</p> <ul style="list-style-type: none"> • Lung cancer is the biggest cause. • Lung cancer and COPD account for over 50% of deaths. • Smoking is the major cause of cancer and COPD. • Pneumonia is often a secondary infection of non-fatal diseases. • Pneumonia affects people with reduced immune response, e.g. the elderly, those on chemotherapy, chronic disease sufferers. • The other diseases cause about 17.5% of deaths in total. • The treatments for some diseases are more effective than those for others.

Level	Mark	Descriptor
Level 0	0	No rewardable material.
Level 1	1-2	<ul style="list-style-type: none"> • Demonstrates isolated elements of knowledge and understanding. • Generic statements may be presented rather than linkages being made. • Lines of reasoning are unsupported.
Level 2	3-4	<ul style="list-style-type: none"> • Demonstrates mostly accurate knowledge and understanding. • Answers evidences occasional linkages among the elements in the context of the question. • Lines of reasoning occasionally supported through the application of recent evidence.
Level 3	5-6	<ul style="list-style-type: none"> • Demonstrates accurate and thorough knowledge and understanding. • Answer evidences comprehensive linkages among the elements in the context of the question. • Lines of reasoning supported throughout by sustained application of relevant evidence.

Question Number	Indicative content	Mark																		
7	<p>Award one mark for each correct point</p> <p>Huntingtons is dominant (1).</p> <p>Non huntington's parent hh (1).</p> <p>Heterozygous parent Hh (1).</p> <p>Correct punnett square /diagram (1):</p> <table border="1" data-bbox="475 584 1286 685"> <tr> <td></td> <td>H</td> <td>h</td> </tr> <tr> <td>h</td> <td>Hh</td> <td>hh</td> </tr> <tr> <td>h</td> <td>Hh</td> <td>hh</td> </tr> </table> <p>Probability 50%/1:1 (1).</p> <p>Homozygous parent HH (1).</p> <p>Correct punnett square /diagram (1):</p> <table border="1" data-bbox="475 913 1286 1014"> <tr> <td></td> <td>H</td> <td>H</td> </tr> <tr> <td>h</td> <td>Hh</td> <td>Hh</td> </tr> <tr> <td>h</td> <td>Hh</td> <td>Hh</td> </tr> </table> <p>Probability 100% (1).</p> <p>Accept any appropriate diagram.</p>		H	h	h	Hh	hh	h	Hh	hh		H	H	h	Hh	Hh	h	Hh	Hh	8
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