



Mark Scheme (Results)

January 2020

BTEC Level 3 Nationals
Sector: Health and Social Care

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

Health and Social Care

Unit 3: Anatomy and Physiology for Health and Social Care

January 2020

Question Number	Answer	Mark
1a	Award one mark for each of the following up to a maximum of two marks: <ul style="list-style-type: none">• A Heart• B Kidney	2

Question Number	Answer	Mark
1b	Award one mark for the identification and one additional mark for the appropriate expansion to a maximum of four marks. Skin <ul style="list-style-type: none">• Insulation (1) from the fat layer/piloerection (1).• Protection (1) cushioning of the tissues (1).• Excretion (1) of urea (1).• Temperature control (1) by sweating (1).• Barrier to pathogens (1) as a hard layer on the surface (1) Uterus <ul style="list-style-type: none">• Allows embryo/foetus to develop (1) by providing food/oxygen (1).• Protect foetus (1) by containing amniotic fluids/thick walls (1).• Expel the baby/birth (1) as is very muscular (1).• Removes toxins/carbon dioxide from the foetal blood (1) across placental membranes (1)• Allows for foetus to attach (1) allowing the placenta to develop (1) Accept any other appropriate wording/alternatives.	4

Question Number	Answer	Mark
1c	<p>Award one mark for any of the following up to a maximum of four marks:</p> <ul style="list-style-type: none"> • stomach • liver • pancreas • duodenum • ileum • colon <p>Do not accept any other structures.</p>	4

Question Number	Answer	Mark
2a	<p>Award one mark for each of the following:</p> <p>Ovaries</p> <ul style="list-style-type: none"> • Production/release/storage of eggs • Produce hormones <p>Testes</p> <ul style="list-style-type: none"> • Manufacture/storage of sperm • Produce testosterone/hormones <p>Fallopian tube</p> <ul style="list-style-type: none"> • Moves eggs/site of fertilisation <p>Vas Deferens</p> <ul style="list-style-type: none"> • Transfers sperm. <p>Accept any other appropriate wording.</p>	4

Question Number	Answer	Mark
2b	<p>Award one mark for identification and one additional mark for appropriate expansion.</p> <ul style="list-style-type: none"> • By mitosis (1) replicating the DNA/producing daughter cells/split into two (1). • Doubling the chromosomes (1) then splitting them (1). <p>Accept any other relevant phrasing/wording.</p>	2

Question Number	Answer	Mark
2c	<p>Award one mark for the identification and one additional mark for the appropriate expansion to a maximum of four marks.</p> <ul style="list-style-type: none"> • Spina bifida mobility/incontinence issues (1) because the backbone does not develop correctly/the vertebral column does not close/gap in the spine (1) • Cerebral palsy Mobility issues/learning difficulties/communication difficulties (1) caused by brain damage/lack of oxygen during birth (1) <p>Accept any other appropriate wording.</p>	4

Question Number	Answer	Mark
3a	<p>Award one mark for each descriptive point to a maximum of four marks.</p> <ul style="list-style-type: none"> • Message received/detected from the sensory organ (1) • Passed to the sensory nervous system/sensory neurons (1) • Brain/spinal cord/central nervous system makes a decision (1) • Messages sent down the motor neuron (1) • Response stimulated (1) <p>Accept specific examples. Accept any other valid response.</p>	4

Question Number	Answer	Mark
3b	<p>Award one mark for the identification and one additional mark for the appropriate expansion to a maximum of four marks.</p> <p>Para sympathetic nervous system</p> <p>Rest (1) relaxes body systems (e.g. reduces heart rate) (1).</p> <p>Sympathetic nervous system</p> <p>Increases rate of body systems (1) e.g. increasing heart rate/digestion (1).</p> <p>Stimulates adrenal glands (1) to produce adrenaline (1)</p>	4

	Accept specific examples e.g. dilating pupils in the eye, speeding up peristalsis, releasing adrenaline, relaxing and contracting muscles, changing breathing rate.	
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Question Number	Answer	Mark
3c	<p>Award one mark for the identification and one additional mark for the appropriate expansion to a maximum of four marks.</p> <p>Produce adrenaline (1) for the fight or flight response (accept specific examples) (1).</p> <p>Produce aldosterone (1) to regulate blood pressure (1).</p> <p>Produce cortisol (1) to regulate metabolism/immune response/reaction to stress/puts sugar in the blood stream (1)</p> <p>Accept any appropriate wording.</p>	4

Question Number	Indicative content	Mark
3d	<p>Dementia is caused by a reduction in brain function, by the death of cells.</p> <p>There are various causes of dementia, e.g. Alzheimers disease, vascular dementia.</p> <p>This can cause loss of mobility due to inability to cause a response in muscles or jerky movements</p> <p>Major effect of dementia is a loss in cognition.</p> <p>This can lead to a lack of ability to care for oneself leading to physical deterioration.</p> <p>People 'forget' how to swallow or feed themselves</p> <p>Incontinence is a common effect</p> <p>Lack of sleep/sundowning effects their physical health.</p>	
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. • Answer 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.
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Question Number	Answer	Mark
4a	<p>Award one mark for any of the following up to a maximum of two marks:</p> <ul style="list-style-type: none"> • Channel air/oxygen to/from the trachea/lungs (1) • Filter dust/particles (1) • Warms air (1) • Moisten air (1) • Pass air/chemicals over smell receptors (1) <p>Accept any other appropriate alternatives.</p>	2

Question Number	Answer	Mark
4b	<p>Award one mark for the identification and one additional mark for the appropriate expansion to a maximum of four marks.</p> <p>Diaphragm</p> <ul style="list-style-type: none"> • Increases the volume of the thorax/chest (1) by contracting (1) <p>Intercostal muscles</p> <ul style="list-style-type: none"> • Reduces the pressure in the thorax/chest (1) by lifting the ribs (1) <p>Accept any appropriate alternatives.</p>	4

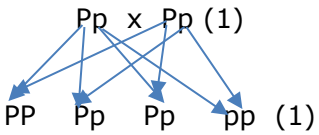
Question Number		Indicative content	Mark
4c		Asthma causes the upper air passages to constrict The volume of the lungs is not affected. It is harder to get air in and out of the lungs. The 'peak flow' is reduced so the ability to get oxygen into the lungs is reduced. The constricted airways can cause wheezing.	6
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. • Answer 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
5a	Award one mark for each of the following: <ul style="list-style-type: none"> • A - liver • B - oesophagus • C - colon • D - stomach 	4

Question Number	Answer	Mark
5b	<p>Award one mark for identification and one additional mark for appropriate expansion.</p> <ul style="list-style-type: none"> • Contains enzyme/amylase (1) to start the breakdown of carbohydrates/starch (1). • Moistens/lubricates food/creates bolus (1) to make swallowing easier (1). <p>Accept any other appropriate answer or relevant phrasing/wording.</p>	2

Question Number	Answer	Mark
5c	<p>Award one mark for the identification and one additional mark for the appropriate expansion to a maximum of four marks.</p> <ul style="list-style-type: none"> • Increase the surface area (1) to increase absorption of nutrients (1). • Good blood supply (1) to maintain a concentration gradient (1). • One cell thick (1) so a short diffusion path (1). • Contain a lacteal/lymph vessel (1) for the absorption of fats (1). • Microvilli on the surface (1) to increase the surface area of the villi. (1). <p>Accept any other valid response.</p>	4

Question Number		Indicative content	Mark
5d		<p>There is both mechanical and chemical digestion. The teeth break food down into smaller pieces. Amylase in the mouth starts the chemical break down of carbohydrates.</p> <p>The stomach mixes the food with acid to break it down further and produces chime.</p> <p>Most of the chemical digestion happens in the small intestine/duodenum.</p> <p>This is by enzymes produced in the gut wall and in the pancreas.</p> <p>Enzymes are specific to food types (proteases-protein, amylases -carbohydrates, lipases -fats).</p> <p>These break food down to small enough chemicals to be absorbed into the body.</p>	
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, there will be major gaps or omissions • Few of the points made will be relevant to the context in the question • Limited discussion which contains generic assertions rather than considering different aspects and the relationship between them. 	
Level 2	3-5	<ul style="list-style-type: none"> • Demonstrates some accurate knowledge and understanding, with only minor gaps or omissions • Some of the points made will be relevant to the context in the question, but the link will not always be clear • Displays a partially developed discussion which considers some different aspects and some consideration of how they interrelate, but not always in a sustained way 	
Level 3	6-8	<ul style="list-style-type: none"> • Demonstrates mostly accurate and detailed knowledge and understanding • Most of the points made will be relevant to the context in the question, and there will be clear links • Displays a well-developed and logical discussion which clearly considers a range of different aspects and considers how they interrelate, in a sustained way 	

Question Number	Answer	Mark
5e	<p>Award one mark for each of the following points up to a maximum of three marks, award one mark for the correct probability giving a maximum of four.</p> <ul style="list-style-type: none"> • PKU is a recessive disorder (1) • Carriers are heterozygous (1) <p>(accept any appropriate symbol)</p>  <p style="text-align: center;">Pp x Pp (1)</p> <p style="text-align: center;">PP Pp Pp pp (1)</p> <ul style="list-style-type: none"> • 1 in 4/ 1:3 / 25% probability of the child having PKU (1). 	4

Question Number	Answer	Mark
6a	<p>Award one mark for each of the following up to a maximum of two marks:</p> <ul style="list-style-type: none"> • 13 million plus 15 million (1) • Giving 28 million (1) 	2

Question Number	Answer	Mark
6b	<p>Award one mark for the identification and one additional mark for the appropriate expansion to a maximum of four marks.</p> <ul style="list-style-type: none"> • The liver is infected (1) leading to liver failure (1) • It causes jaundice (1) so the person looks yellow (1) • High temperature (1) as the body fights the infection (1) • Itchy skin (1) caused by toxins in the blood (1) • Dark urine (1) caused by Bilirubin/breakdown of red blood cells (1) 	4

	<ul style="list-style-type: none"> • Nausea (1) caused by toxin build up (1) • Lethargy (1) due to liver failure (1) • Swollen liver (1) leading to abdominal pain (1) <p>Accept any other valid response.</p>	
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Question Number	Answer	Mark
6c	<p>Award one mark for the identification and one additional mark for the appropriate expansion to a maximum of four marks.</p> <ul style="list-style-type: none"> • Stores carbohydrate/glucose/sugar (1) as glycogen (1) • Produces bile (1) for fat digestion (1) • Deaminates amino acids (1) producing urea (1) • Detoxifies (1) removing toxins/alcohol from the system (1) • Produces glucagon (1) to raise blood sugar levels/provide energy (1) • Recycles haemoglobin (1) by breaking down red blood cells (1) <p>Accept any other valid response.</p>	4

Question Number	Indicative content	Mark
7	<p>CVD includes CHD, stroke, anaemia, hypertension.</p> <p>Coronary heart disease (CHD) caused by atherosclerosis. This is 'furring' of the arteries. Caused by lifestyle factors. The blood supply to the heart muscles is disrupted. The heart is less efficient so less blood is pumped around, this is more pronounced when the demand is raised. The reduced oxygen supply causes lethargy and lack of energy. The inability to get enough oxygen into the blood can lead to breathlessness. There can be pain in the heart muscle, this is called angina. CHD can lead to heart attack/failure. Stroke is caused by blood clots. Hypertension has no symptoms. Anaemia reduces the blood's ability to carry oxygen.</p>	
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, there will be major gaps or omissions. • Few of the points made will be relevant to the context in the question. • Limited discussion which contains generic assertions rather than considering different aspects and the relationship between them.
Level 2	3-5	<ul style="list-style-type: none"> • Demonstrates some accurate knowledge and understanding, with only minor gaps or omissions. • Some of the points made will be relevant to the context in the question, but the link will not always be clear. • Displays a partially developed discussion which considers some different aspects and some consideration of how they interrelate, but not always in a sustained way.
Level 3	6-8	<ul style="list-style-type: none"> • Demonstrates mostly accurate and detailed knowledge and understanding • Most of the points made will be relevant to the context in the question, and there will be clear links. • Displays a well-developed and logical discussion which clearly considers a range of different aspects and considers how they interrelate, in a sustained way.

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