

Level 3 Lead Examiner Report 1906

Summer 2019

**Level 3 National in Health and
Social Care**

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

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A grade boundary is where we set the level of achievement required to obtain a certain grade for the externally assessed unit. We set grade boundaries for each grade, at Distinction, Merit and Pass.

Setting grade boundaries

When we set grade boundaries, we look at the performance of every learner who took the external assessment. When we can see the full picture of performance, our experts are then able to decide where best to place the grade boundaries – this means that they decide what the lowest possible mark is for a particular grade.

When our experts set the grade boundaries, they make sure that learners receive grades which reflect their ability. Awarding grade boundaries is conducted to ensure learners achieve the grade they deserve to achieve, irrespective of variation in the external assessment.

Variations in external assessments

Each external assessment we set asks different questions and may assess different parts of the unit content outlined in the specification. It would be unfair to learners if we set the same grade boundaries for each assessment, because then it would not take accessibility into account.

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Anatomy and Physiology for Health and Social Care

Grade	Unclassified	Level 3			
		N	P	M	D
Boundary Mark	0	9	19	34	49

Introduction

This is the fourth sitting of this paper. The structure of the exam has not altered across the papers. Many centres are now using past papers to prepare learners, and this is obvious in the responses seen by the examiners. This was most apparent in the responses of the higher achieving learners. These learners can apply their knowledge of the areas of the specification to the scenarios and questions presented in the paper. However, for the lower achieving learners a significant number still are unable to recall basic biological knowledge. Centres need to emphasise with their learners that this unit requires a lot of recall of information, especially about the different body systems and learners should prepare themselves so they can gain the recall marks as these are a relatively high proportion of the marks available.

Introduction to the Overall Performance of the Unit

The unit has performed well at the distinction boundary, this seems to be because the learners were well prepared and had practiced the requisite skills needed to access the extended questions. At the pass boundary there was a small improvement in performance. Learners are still struggling to recall the information that is intrinsic to this unit. Some learners could recall basic information about disorders but struggled to write a coherent and logical answer that linked the causes to the symptoms, this is a skill that can be improved by practice, using the past papers and centre devised material. A significant minority of learners appeared to have little knowledge of disorders that are named in the specification, often by offering very generic answers or occasionally describing unrelated disorders.

Individual Questions

1a Good Response

Two types of muscle tissue accurately stated as required by the command verb **State**.

1	(a) State two types of muscle tissue.	(2)
1	Cardiac	
2	Skeletal (striated)	

Poor Response

Two type of tissue stated but they are not muscle tissues so no rewardable response.

1	(a) State two types of muscle tissue.	(2)
1	Epidermal Epidermous	
2	Soft tissue's Connective	

1(b) Good Response

Two types of connective tissue identified then the answer expanded with an accurate function. This is the structure required by the command verb **explain**.

(b) Explain the function of **two** kinds of connective tissue other than blood. (4)

1. One other type of connective tissue is cartilage. The function of cartilage is to prevent bones from sliding off of one another, to act as a shock absorbant and reduce friction
2. Another type of connective tissue is adipose. This tissue is a fatty tissue, and its function is to insulate the body.

Poor Response

Two kinds of connective tissue are correctly identified but the expansions are incorrect so not rewardable.

(b) Explain the function of **two** kinds of connective tissue other than blood. (4)

1. Cartilage - is in the brain and ~~allow~~ structures brain
2. ~~Alavo~~ - allows blood to pass
 Avolea - another term for fat ~~sub~~ tissue
 insulates body

1 (c) Good Response

Two correct identifications appropriately expanded to **explain** two functions of blood.

(c) Explain **two** functions of blood. (4)

- 1 Contains haemoglobin to carry oxygen and with nutrients to all the body cells for respiration and breathing.
- 2 Contains white blood cells that fight infection (lymphocytes) to maintain a constant temperature of 37 so no external factors are affecting homeostatic mechanism of thermoregulation.

Poor Response

The response is very generic and does not accurately identify a function of blood and there is no attempt to expand the answer. Marks could have been gained by expanding the generic statements e.g. by supplying oxygen/nutrients etc although all the marks would not have been gained.

(c) Explain **two** functions of blood. (4)

- 1 Its function is to keep the human body alive
- 2 Its function is to make sure that all the organs function properly

2(b) Good Response

An accurate **outline** of the role of both structures is given

(b) Outline the role of the following: (4)

Urethra

The urethra is the part that expels urine from the bladder out of the body.

Bladder

The bladder stores collected urine until it is expelled through the urethra by urination.

Poor Response

The response demonstrates a lack of knowledge of the roles of the identified structures, these structures are directly referenced in the specification and it is expected that learners are familiar with them.

(b) Outline the role of the following: (4)

Urethra

Therefore, they take out the nutrients and things you need from food and then with waste it is stored for us to get rid of it and out of our body.

Bladder

collects waste from inside the body and all the bacteria so we are able to urinate to clean the body.

2(c) Good Response

Two effects are identified and expanded; the response is a good **explanation**.

(c) Explain **two** effects of renal failure. (4)

1 One effect of renal failure is that the blood fills with waste products like urea. This means that the blood in the body becomes toxic because the kidneys aren't removing them.

2 Another effect of renal failure is incontinence. This is because the body may be unable to identify if the bladder is full if it is failing which could lead to incontinence.

(Total for Question 2 = 10 marks)

Poor Response

Two effects of renal failure are not identified or expanded. There is a comment about cleaning blood that could be interpreted as a failure to filter but is too generic to be awarded marks at this level.

(c) Explain **two** effects of renal failure.

(4)

- 1 renal failure means ~~rather~~ blood vessels are affected and are not able to pass to the kidneys.
- 2 when kidney cannot get enough blood, water it ^{damages} ~~will not~~ can be ~~damage~~ ~~and~~ because it won't be able to clean the blood and provide urine. This can be hard for the person to urinate.

(Total for Question 2 = 10 marks)

3(a) Good Response

Two functions of the skeletal system are appropriately **outlined** by providing correct examples

3 (a) Outline **two** functions of the skeletal system. (4)

- 1 To protect the bodies internal organs by having bones around them, for example the ribs protect the lungs and heart. It stops any damage to them when falling.
- 2 Producing of blood cells, the bone marrow creates lots of new blood cells in the body which allows us to grow and function. Especially red blood cells and white blood cells

Poor Response

Two generic statements are provided that gain some of the available marks, for movement and support, but there is not enough detail to access all four marks on offer.

3 (a) Outline **two** functions of the skeletal system. (4)

- 1 Allows movement of the body.
- 2 Allows Holds organs in place.

3(b) Good Response

Two descriptive points giving a property and example for each joint is given, providing an effective **comparison**.

(b) Compare fibrous joints and cartilaginous joints.

(4)

Fibrous joints provide no movement at all and are filled with a fibrous capsule. Fibrous joints can be found between the skull, connecting the bones together.

Cartilaginous joints offer slight movement and are filled with a cartilaginous capsule. They can be found in the sphenoid pubis.

Poor Response

The response is confused about the joints, the examples given are not correct examples of the types of joints required.

(b) Compare fibrous joints and cartilaginous joints.

(4)

Cartilaginous joints are from cartilage and are more flexible than bone so it allows more movement but strong so it cannot / more unlikely to break or injure. ~~Fibrous~~ ~~joints~~ ~~are~~ ~~bone~~ It can only allow the bone to move up and down ^{e.g. knee cap} however, fibrous joints allow other movements such as circular, ~~so~~ ^{for} example, the elbow.

3(c) Good Response

Two functions are correctly identified, and the response is expanded to provide an effective explanation.

(c) Explain **two** functions of synovial fluid in a joint. (4)

- 1 One function of the synovial fluid is to lubricate the joint. This means that the bones and cartilage at the ends of the joint are protected from the friction that would damage them
- 2 Another role of the synovial fluid is to prevent the ends of the two bones from touching. This means that it stops the materials from grinding together and reducing

Poor Response

The response is not worded clearly enough to allow any rewardable points.

(c) Explain **two** functions of synovial fluid in a joint. (4)

- 1 to hold both sides together so they dont ~~break~~ break away the joints
- 2 to allow them to ~~be~~ be flexible and to move the joints

3(d) Good Response

The learner has demonstrated accurate knowledge, e.g. a fracture may lead to blood loss in the short term, if it isn't as serious it can lead to mobility problems, and there can be an effect on the musculature. This shows linkages and reasoning.

(d) Explain the problems that a fracture of the femur may cause.

(6)

A fracture in the femur may cause problems in that depending on the break can impact the severity. An open fracture may rupture the main artery in the leg causing severe blood loss. However, if this is not the case this fracture will cause mobility problems, likely short term until the fracture ~~heals~~ recovers. Furthermore, it may cause problems later on in that if the leg has not been able to move problems for a while, this may cause stiffness. Also, the muscles in the leg may lose some elasticity if they haven't moved very much during the recovery process. This may result in needing physiotherapy once the femur has recovered from the fracture.

Poor Response

Although the learner has correctly identified the femur, they have only shown isolated elements of knowledge, there are no linkages made and there is no supported reasoning. The answer would have been improved by e.g. explaining why bleeding and swelling may occur.

(d) Explain the problems that a fracture of the femur may cause.

(6)

As femur is the longest bone it can ~~cause~~ be damage due to accidents, injuries and illness

A fracture can ~~can~~ make it difficult for the individual to walk it can become stiff too

can cause swelling and bleeding

4(a) Good Response

Two accurate roles are stated

4 (a) State **two** roles of the pituitary gland. (2)

- 1 Secretes hormones that help with growth and development and osmoregulation.
- 2 It secretes hormones like FSH, LH that help with ovulation, pregnancy and secondary sex characteristics

Poor Response

Although the learner has recognised that the pituitary sends messages, they have not been able to state this accurately.

4 (a) State **two** roles of the pituitary gland. (2)

- 1 Send signals to and from other places to make something happen
- 2 They help the brain to uses it's senses as best as possible.

4(b) Good Response

Four good descriptive points have been made.

(b) Describe the effects of adrenaline on the body.

(4)

When adrenaline is released into the body it causes our heart rate and breathing rate to increase. This is because it is preparing our body for the 'flight or fight' response. This means that if we decide to run, there is already enough glucose and oxygen in our blood stream for us to do so.

Poor Response

One point has been made about increased heart rate, this has been repeated in other words, and the point about 'more active' is too generic to warrant a mark.

(b) Describe the effects of adrenaline on the body.

(4)

Adrenaline makes the blood pump faster around the body which causes your body to become more active.

Adrenaline makes your heart rate increase leading the person to be more aware too.

4(c) Good Response

A levelled question, the learner demonstrates understanding with comprehensive linkages on the effects of hypothyroidism.

(c) Describe hypothyroidism.

(6)

Hypothyroidism is a condition in which the thyroid glands fails to produce enough thyroxine ~~so~~ produces underactive thyroxine levels. Thyroxine is a hormone produced by the thyroid gland which plays a function in regulating ones metabolism, growth and development. This condition can be caused by a pituitary gland disorder, ^{= fails to signal thyroid gland to produce thyroxine} thyroid gland surgery, ^{and} pregnancy due to the lack of iodine in diet. As a result, one become intolerant to cold as ~~metabolic~~ muscles are contracting rate is not ~~regulated~~ to keep body ~~warm~~ ^{warm}. One tends to lose or gain weight as the metabolic rate is not regulated to absorb and break down fats and ~~one~~ due to this, it ~~be~~ causes constipation and cold body as blood is not being pumped around properly. To diagnose, get a blood test and increase iodine to regulate ~~body functions~~ (Total for Question 4 = 12 marks)

Poor Response

The learner has described a condition they have learnt about; however, the description does not match hypothyroidism and there is no rewardable material.

(c) Describe hypothyroidism.

(6)

Hypothyroidism effects what chemical ~~down~~ your body has as it can't always absorb them. However the body needs them. medication can be given to help but it does not stop it from happening. It then causes peoples blood to become very thin or very thick which can be dangerous.

5(a) Good Response

Although there is some inaccuracy in that cilia remove foreign bodies, rather than filter them out of the air, the outline is generally accurate.

5 (a) Outline **one** role of air passages in the nose.

(2)

As air passes through the nasopharynx, ~~pharynx and larynx~~ the mucus is able to filter and trap dust, microorganisms in the cilia mat is found in the nose.

Poor Response

The response is very confused about the air passages in the nose, and seems to describe the involuntary nervous system.

5 (a) Outline **one** role of air passages in the nose.

(2)

Allows you to control the heart rate ^{to} and maintain a steady heart rate. Breathing in through the nose and out the mouth.

5(b) Good Response

More than four good descriptive points are made, an excellent answer.

(b) Describe how alveoli are adapted to carry out their function. (4)

Alveoli are adapted in that they have thin walls, this enables effective gas exchange in that oxygen and carbon dioxide can diffuse easily. Alveoli is folded, this gives it a larger surface area, this means that more oxygen and carbon dioxide can diffuse. Furthermore, alveoli have a good capillary supply which enables the appropriate exchange of gases into the blood stream.

Poor Response

Although the response recognises that gas exchange occurs in the alveoli there is no attempt to link this to adaptations of the alveoli.

(b) Describe how alveoli are adapted to carry out their function. (4)

Alveoli allows CO_2 to be absorbed and passes to the lungs. ~~the~~ absorption and gas exchange takes place in the alveoli

5 (c) Good Response

An excellent response that gives a good explanation of how the intercostal muscles and diaphragm interact to allow ventilation of the lungs.

(c) Explain how the respiratory muscles allow ventilation of the lungs.

(4)

The respiratory muscles are the diaphragm and intercostal muscles. When air is inhaled the lungs expand by the diaphragm contracting and moving down, the internal muscles also pull the ribs down to expand the area inside lungs and let lots of air in. When air is exhaled, the diaphragm move upwards, the external muscles move up and outwards which lets the lungs to go back to original size to push air back out.

Poor Response

The learner appears to think that the heart is involved in ventilation, they understand that ventilation is caused by a change in air pressure but have not articulated this accurately enough to be rewarded for it.

(c) Explain how the respiratory muscles allow ventilation of the lungs.

(4)

They allow the bodys to compress and decompress air by moving the body in and out to allow carbon dioxide out and oxygen in. This is also helped by the pumping of the heart which helps push it around the body.

5 (d) Good Response

The response demonstrates accurate and thorough knowledge, follows coherent chains of reasoning with an application of their knowledge to different body systems.

(d) Explain the effect of smoking on body systems.

(8)

Smoking affects the respiratory system in that the toxins in cigarettes damage the alveoli making them not able to function correctly. This can cause ^{of variety of respiratory disorders} such as bronchitis, emphysema, lung cancer, COPD, etc. In the lungs being affected this way, gaseous exchange may not be able to effectively occur, this will impact the amount of oxygen that is supplied to the bloodstream, which would affect the amount of oxygen muscles get. Another system affected by smoking is that if breathlessness occurs, this can reduce the amount of oxygen to muscles. This means that the muscles will have to work anaerobically, which leads to the waste lactic acid in the muscles, this causes fatigue and cramp affecting the function of the muscles. A further system that is affected is the cardiovascular system in that some toxins from the smoke / cigarette will enter the bloodstream, this is likely to cause damage to the blood vessels affecting their ability to carry out their function in the body. This could possibly lead to conditions such as valves not working properly.

Poor Response

This response recognises that smoking affects the lungs, heart etc, but the knowledge is superficial and there is a partial attempt to apply their knowledge of smoking to the effect on body systems.

(d) Explain the effect of smoking on body systems.

Smoking can effect ^{throat cancer} ^{heart problems.} ^{decays body.} peoples breathing caused by the decaying and pressure put on the heart and ungs. It causes a build up of tar on the lungs, causing rattling coughs and breathlessness. This decreases life expectancy people the body has to work harder to function. Smoking can the lead to, -throat cancer, teeth decay, heart and lung failure which arent always treatable. Your bodies immune system is often slower due to how hard it has to work in other areas. making individuals more prone to illness.

6(a) Good Response

The response has used the data provided to produce an accurate comparison.

(a) Compare the change in COPD rates between the most and least deprived groups in society.

(4)

As the years increase, the number of people per 100,000 ever diagnose with chronic obstructive pulmonary disorder increase for both groups. The most deprived groups starts with approximately 2550 people with COPD in 2004 to just under 3150 in 2012. However, the least deprived groups begins with approximately 900 people with COPD to approximately 1250 in 2012. Therefore, more people are being diagnosed with COPD in the most deprived groups compared to the least deprived groups.

Poor Response

Generic comments about the information are made but there is no attempt to use the data provided to make a comparison in a way that would be expected of a level 3 learner.

(a) Compare the change in COPD rates between the most and least deprived groups in society.

(4)

The rates had increased from both groups however the most deprived was significantly higher than least deprived. This shows more and more people are getting COPD.

6(b) Good Response

The learner has applied their knowledge of chronic pulmonary disorder and linked to to their knowledge of the effects of ageing on body systems and produced a good answer.

(b) Explain why people in the 65 and above age group are more likely to die of COPD.

(4)

Older people have lived longer, meaning they have had more time for there things to change or to damage them. They would of had a larger amount of time to be able to smoke or be around harmful substances which would damage their respiratory system. There is also more public health awareness now for people to follow and live a healthy life then there was 65 years ago when people were smoking and drinking lots, which has now caused problems like COPD for them when they are older.

Poor Response

The learner has confused COPD and cardiovascular disease and made simplistic links to the effects of ageing.

(b) Explain why people in the 65 and above age group are more likely to die of COPD.

(4)

As they are getting older their bodys are too and things will start to fail like their pulmonary arterie which is an important part of the blood circulation in the body as it is dying, blood wont be able to go around the body leading to death.

6(c) Good Response

The response uses the data provided and the learners own knowledge of the different disorders and makes comprehensive linkages. The evidence is applied well.

(c) Describe the effect of different lung diseases on death rates, in 2012.

(6)

Lung ~~can~~ cancer is the most popular because of the high amount of people who have smoked and now have got cancer from it. Cystic fibrosis is the smallest as it is an inherited condition which is why not a lot of people have it because it has to be passed along by recessive genes, it's not a lifestyle choice ^{and you can live for many years before dying}. COPD is also a high death rate however if controlled it's not something you can die from fast, compared to lung cancer which if not treated fast you can die from very quickly. Pneumonia is also around the same as COPD as it's because of problems with alveoli, they become infected and filled with fluid, thus therefore if not treated can lead to death however is not rapid and can live longer than a year.

(Total for Question 6 = 14 marks)

Poor Response

The response repeats the information provided without any attempt to use their own prior knowledge.

(c) Describe the effect of different lung diseases on death rates, in 2012.

(6)

The main lung diseases that had a huge effect on death rates in 2012 was Lung cancer, and Pneumonia and COPD these had the highest death rates where as cystic fibrosis and other lung diseases weren't high at all.

7 Good Response

This response uses the genetic diagram well and then explains the probability accurately using the learner's own knowledge that the condition is dominant. The answer could have been improved if the learner had recognised that the parent could have been homozygous so there are two probabilities depending on the genotype of the parent.

Huntington's disease is an inherited disorder that affects the nervous system.

7 What is the probability of a child with one parent who has Huntington's disease, being a sufferer themselves?

Include a genetic diagram in your answer.

(8)

If an individual has Huntington's disease they only need to have ^{at least} one dominant allele to have the condition.

50% = Hh The child has the probability of having the condition of 50%, in that if 50% = hh the other parent doesn't have the condition they will have two recessive

	H	h
H	HH	Hh
h	Hh	hh

alleles. Where as, having the condition at least one needs to be present. In having 2 recessive this is homozygous. The child also has a 50% chance of not having Huntington's. If the child have the ~~genotype~~ Hh ~~genotype~~ (Heterozygous) they will suffer from Huntington's disease. The child does not have a possibility of being a carrier in that for the disease the individual either has the condition or doesn't have the condition.

Poor Response

The learner has not used a genetic diagram as requested in the question, they then suggest that there is an environmental aspect to the condition. There is no attempt to calculate a probability.

Huntington's disease is an inherited disorder that affects the nervous system.

- 7 What is the probability of a child with one parent who has Huntington's disease, being a sufferer themselves?

Include a genetic diagram in your answer.

(8)

It is more likely for the child to develop Huntington's disease because of the genes (nature). It is likely it will be passed down the family. As they are just living with the one parent who is a sufferer themselves can also impact on their chance as it maybe because of the environment they are ~~the~~ living in or the air pollution.

Summary

- Learners should concentrate on ensuring that they can recall the basic anatomy relating to the body systems identified in the specification.
- To access the questions about disorders learners, need to ensure that they can recall the appropriate symptoms relating to each disorder.
- Centres should use the past papers and SAMS to practice the application of knowledge especially in the levelled mark scheme questions.
- The use of a monohybrid genetic diagram to exemplify an answer is straightforward and can improve the marks that a learner gains significantly. Learners should be aware of the genetics of each of the conditions identified in the specification and have sufficient genetic vocabulary to explain that appropriately.
- Learners should ensure that they are familiar with the structure and organisation of the human body identified in section A of the specification as this underpins understanding of the different body systems.



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