

**GCE**

**Health and Social Care**

Unit **F921**: Anatomy and Physiology in Practice

Advanced GCE

**Mark Scheme for June 2016**

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All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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## Annotations

Annotation	Meaning
	Positive
	Negative
	Benefit of doubt
	Cross
	Level 1
	Level 2
	Level 3
	Level 4
	Repeat
	Noted but no credit given
	Too vague
	Tick
	Development of point
	Omission mark

Question		Answer	Marks	Guidance	
				Content	Levels of response
1	a	<p><b>Identify the parts indicated in the diagram of a human elbow.</b></p> <p>1 muscle/triceps – accept biceps</p> <p>2 bone /humerus</p> <p>3 tendon</p> <p>4 synovial fluid</p> <p>5 cartilage</p>	5		
	b	<p><b>i</b></p> <p><b>Identify a dysfunction of either the musculo-skeletal or neural systems.</b></p> <p><b>One from:</b>            Arthritis            Osteoporosis            Multiple sclerosis            Parkinson's</p>	1	Accept stroke	
	b	<p><b>ii</b></p> <p><b>Identify a structure from Fig.1 that would be primarily affected by the named dysfunction.</b></p> <p>Arthritis – 5 or cartilage (accept bone)            Osteoporosis – 2 or bone/humerus            Multiple sclerosis – 1 or muscle/triceps            Parkinson's - 1 or muscle/triceps            Stroke - 1 or muscle/triceps</p>	1		

Question		Answer	Marks	Guidance	
				Content	Levels of response
	<b>c</b>	<p><b>Explain how a named dysfunction of either the musculo-skeletal or neural systems could be diagnosed</b></p> <p>Arthritis:  Osteo –arthritis by clinical observation and X-rays (accept references to imaging techniques e.g. ultrasound) which shows up damage to cartilage/ bone and spur growths  Rheumatoid –X-rays to investigate degree of inflammation. Blood tests for rheumatoid factor antibody</p> <p>Osteoporosis:  Bone density tests. Low dosage X-rays measure density. Computer compares to norms.  Clinical observation –decrease in height, curvature of spine, pain  Fractures</p> <p>Multiple sclerosis:  Evoked visual response. Time for visual stimulation to reach brain compared with norms  MRI –moving magnet used to detect scarring/demyelination  Lumbar puncture – spinal fluid tested for abnormal white cell count  Clinical observation and discussion of symptoms</p>	6	<p>Level 2  Developed explanation.  Includes accurate terminology.  Effects will be accurate and developed.  High/mid-QWC.</p> <p>Level 1  Simple explanation.  Limited appropriate terminology.  Effects may be limited.  Low QWC.</p>	<p>Level 2 [4-6 marks]  Candidates will provide a developed explanation that includes accurate terminology and follows a logical sequence. Candidates need to <b>explicitly</b> link the condition to the technique to gain full marks. Answer is supported by use of accurate explanation of the technique. Sentences and paragraphs are relevant with accurate use of appropriate terminology. There may be occasional errors of grammar, punctuation and spelling.</p> <p>Level 1 [1-3 marks]  Candidates' will explain the technique in a limited manner. Likely to be a description/identification only. Their use of appropriate terminology will be limited. Sentences and paragraphs are not always relevant, with the material presented in a way that does not always address the question. There may be noticeable errors of grammar, punctuation and spelling and answers may be list like.</p> <p>0 – response not worthy of credit.</p>

Question			Answer	Marks	Guidance	
					Content	Levels of response
			Parkinson's CT/MRI scans to eliminate other causes of symptoms eg tumours Positive response to anti parkinsonism drugs Clinical observation and discussion  Stroke CT/MRI to identify cause/type of stroke Angiography to locate blockages of blood vessels Carotid Doppler scanning to observe blood flow Clinical observation – FAST			

Question		Answer	Marks	Guidance	
				Content	Levels of response
	d	<p><b>Describe the impact that a named dysfunction of either the musculo-skeletal or neural systems could have on the daily activities of an individual.</b></p> <p>Arthritis            Difficulty sleeping due to pain            Unable to carry on with main job if physical            Difficulty in opening jars or grasping objects            Hard to maintain interests such as sport/walking/gardening/knitting/sewing            Hard to walk to shops/carry bags            Hard to wash/bathe</p> <p>Osteoporosis            Difficulty sleeping due to pain            May be difficult to carry on with high impact sports            Concern over falls if ground slippery – curtails shopping/social activities in bad weather</p> <p>Multiple sclerosis            Depending on severity and location of damage – may have difficulty in standing and thus working, impaired vision may prevent driving/working            Socialising may be affected by lack of bladder/bowel control</p>	7	<p>Level 3            Fully developed description.            Accurate terminology.            High QWC.</p> <p>Level 2            Sound description.            Accurate terminology.            Mid-QWC.</p> <p>Level 1            Basic description.            Limited use of terminology.            Low-QWC.</p> <p>Note: Simply describing symptoms will not gain marks. The emphasis is on specific named <b>daily tasks</b> or <b>activities</b>.</p>	<p>Level 3 [6 – 7 marks]            Candidates will provide a fully developed description that includes accurate terminology and follows a logical sequence.            Reference must be made to specific activities or tasks.            Sentences and paragraphs are relevant with accurate use of appropriate terminology. There may be occasional errors of grammar, punctuation and spelling.</p> <p>Level 2 (4 - 5 marks)            Candidates will provide a sound description that includes accurate terminology. Reference must be made to specific activities or tasks.            Sentences and paragraphs are generally relevant but may have minor inaccuracies or lack clarity and depth of understanding. There may be some errors of grammar, punctuation and spelling.</p> <p>Level 1 [1 - 3 marks]            Candidates' will describe the effects/impact in a limited manner.            Their use of appropriate terminology will be limited. Likely to be vague or over dramatic references to PIES. Sentences and paragraphs are not always</p>

Question			Answer	Marks	Guidance	
					Content	Levels of response
			Parkinson's Daily tasks difficult due to stiffness/tremors –cooking/shopping/bathing/driving Writing becomes difficult  Stroke Unable to speak/work/drive/dress/bathe/socialise			relevant, with the material presented in a way that does not always address the question. There may be noticeable errors of grammar, punctuation and spelling and answers may be list like.  0 – response not worthy of credit

Question		Answer	Marks	Guidance	
				Content	Levels of response
2	a	<p><b>Identify three functions of the blood.</b></p> <p>Three from:            Transporting [named] nutrients            Transporting [named] waste products            Transporting oxygen            Fighting disease            Regulating temperature            Carrying hormones            Accept clotting</p>	3	<p>Transporting nutrients/waste products can be both general and specific            Accept three separate answers with specific examples of transported materials</p>	
2	b	<p><b>Explain two ways blood capillaries are adapted to perform their functions.</b></p> <p>One cell thick/thin cells to allow rapid transport of materials            Possess holes in specialised capillaries (glomerulus) to allow ultra-filtration            Large numbers to present large surface area            Small size reduces blood flow to provide time for exchange of materials            Semi-permeable so allowing retention of some blood proteins            Surrounded by basement membrane –acts as a sieve.</p>	2 X 2	<p>Two points, two marks each</p> <p>If identifying adaptations only, award two marks</p>	

Question			Answer	Marks	Guidance	
					Content	Levels of response
2	c	i	<p><b>A number of factors can contribute to the development of a cardio-vascular dysfunction.</b></p> <p><b>Identify one of these factors that is beyond the control of an individual.</b></p> <ul style="list-style-type: none"> <li>• Age</li> <li>• Genetics/predisposition/family history</li> <li>• Gender</li> </ul>	1		

Question			Answer	Marks	Guidance	
					Content	Levels of response
2	c	ii	<p><b>Describe the possible effects of poor lifestyle choices on the development of cardio-vascular dysfunction.</b></p> <p>Candidates may refer to the following lifestyle choices:</p> <ul style="list-style-type: none"> <li>• Smoking</li> <li>• High alcohol intake</li> <li>• High fat diet</li> <li>• High salt diet</li> <li>• High sugar diet/obesity</li> <li>• Lack of exercise</li> <li>• High levels of stress</li> <li>• Untreated diabetes/high blood pressure</li> </ul> <p>Effects:</p> <p>Appropriate references to high cholesterol/fat levels/ lack of exercise leading to atheroma/angina/heart attacks</p> <p>High blood pressure leading to heart attacks/strokes. Links to salt/stress/alcohol/smoking</p> <p>Smoking linked to changes in blood chemistry/composition</p> <p>Diabetes leading to vascular damage, strokes.</p>	6	<p>Level 2 Developed description Includes accurate terminology. High QWC</p> <p>Level 1 Simple description. Limited appropriate terminology.. Low QWC.</p>	<p>Level 2 [4-6 marks] Candidates will provide a developed description that includes accurate terminology and follows a logical sequence. Sentences and paragraphs are relevant with accurate use of appropriate terminology. There may be occasional errors of grammar, punctuation and spelling.</p> <p>Level 1 [1-3 marks] Candidates' will describe possible effects in a limited manner. Their use of appropriate terminology will be limited. Sentences and paragraphs are not always relevant, with the material presented in a way that does not always address the question. There may be noticeable errors of grammar, punctuation and spelling and answers may be list like.</p> <p>0 – response not worthy of credit</p>

Question		Answer	Marks	Guidance	
				Content	Levels of response
2	d	<p><b>Explain how a named cardio-vascular dysfunction may be treated.</b></p> <p>Coronary heart disease Use of statins to reduce cholesterol levels Use of drugs to lower blood pressure Change of diet Weight loss exercise</p> <p>Coronary bypass surgery/angioplasty using artery from chest. Attached either side of affected area using angiograms to guide</p> <p>Angina Drugs eg. Used to dilate arteries</p> <p>Heart attacks Use of aspirin/warfarin Clot busting enzymes</p> <p>Hypertension Drugs to reduce blood pressure Drugs to remove water levels Exercise Weight loss Diet change</p> <p>Stroke Clot busting drugs Use of aspirin/warfarin Surgery to remove clots Speech therapy Physiotherapy</p>	6	<p>Candidates must explain how the treatment deals with the issues of the dysfunction.</p> <p>Level 2 Developed explanation. Includes accurate terminology. Effects will be accurate. High/Mid-QWC.</p> <p>Level 1 Simple explanation. Limited appropriate terminology. Effects may be limited. Low QWC.</p>	<p>Level 3 [4-6 marks] Candidates will provide a developed explanation that includes accurate terminology and follows a logical sequence. Candidates need to <b>name</b> the condition to gain full marks. Answer is supported by use of accurate explanation of the technique. Sentences and paragraphs are relevant with accurate use of appropriate terminology. There may be occasional errors of grammar, punctuation and spelling.</p> <p>Level 1 [1-3 marks] Candidates' will explain the treatment in a limited manner. Likely to be a description/identification only. Their use of appropriate terminology will be limited. Sentences and paragraphs are not always relevant, with the material presented in a way that does not always address the question. There may be noticeable errors of grammar, punctuation and spelling and answers may be list like.</p> <p>0 – response not worthy of credit.</p>

Question			Answer	Marks	Guidance	
					Content	Levels of response
			Exercise Diet change  Accept suitable answers for arrhythmia and heart murmurs			

Question		Answer	Marks	Guidance	
				Content	Levels of response
3	a	<p><b>Describe a function for each of the following:</b></p> <p>1 Oestrogen – help repair wall/thickens wall of uterus after menstruation, reduce FSH release, initiates release of LH, regulate secondary sexual characteristics</p> <p>2 Graafian/mature follicle – nurturing/supplying ovum/egg with nutrients producing oestrogen</p> <p>3 Ciliated oviduct – movement/transport of egg/ovum/blastula to uterus</p> <p>4 Corpus luteum – production of progesterone</p>	4 X 1		
3	b	<p><b>Describe the location and process of fertilisation.</b></p> <p><b>Location</b> - anywhere near top/beginning of fallopian tube –accept 'fallopian tube'</p> <p><b>Process</b> - Only one sperm normally fertilises egg Head/nucleus penetrates egg using enzymes in the acrosome and fuses with egg nucleus. Cell division follows. Membrane forms round egg to prevent further sperm entry.</p>	4	<p>One mark for location</p> <p>Three marks for process</p> <p>One mark for each of three separate points or for two developed points.</p> <p>One simple point - one mark.</p>	

Question		Answer	Marks	Guidance	
				Content	Levels of response
3	c	<p><b>Describe FOUR functions of the uterus in the development and birth of a baby.</b></p> <p>Tissues of endometrium feed developing embryo  Placenta and umbilical cord develop to provide nutrients and oxygen for baby and remove waste products  Amniotic sac produces fluid to protect baby –except uterus wall protects the developing embryo/baby  Produce hormones to maintain pregnancy and override menstrual cycle</p> <p>Muscles of myometrium used to move/engage baby, expel baby during birth followed by placenta or afterbirth</p>	4 X 1	Four simple descriptions required.	

Question		Answer	Marks	Guidance	
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3	d	<p><b>Evaluate the use of in vitro fertilisation (IVF) as a treatment for female infertility.</b></p> <p>Positives:</p> <p>Overcomes fertility issues Readily available Initial rounds of treatment may be free Allows same sex partners to conceive Allows older women to conceive Involves screening for genetic defects</p> <p>Negatives:</p> <p>Can result in birth defects Can result in multiple births Relatively low success rate Can end up being very expensive Very intrusive and can be very stressful</p>	8	<p>Level 3 Fully developed evaluation of IVF. Includes accurate terminology. High QWC.</p> <p>Level 2 Developed evaluation. May not be balanced. Includes accurate terminology. Mid-QWC.</p> <p>Level 1 Simple evaluation. Limited appropriate terminology. Low QWC.</p>	<p>Level 3 [7 - 8 marks] Candidates will provide a fully developed evaluation of IVF that includes accurate terminology and follows a logical sequence. Both positives and negatives will be given. Sentences and paragraphs are relevant with accurate use of appropriate terminology. There may be occasional errors of grammar, punctuation and spelling.</p> <p>Level 2 [4 - 6 marks] Candidates will provide an evaluation of IVF that includes accurate terminology. Some positives and negatives will be given. Sentences and paragraphs are generally relevant but may have minor inaccuracies or lack clarity and depth of understanding. There may be some errors of grammar, punctuation and spelling.</p> <p>Sub-max of 4 marks if only either positives or negatives done well.</p> <p>Level 1 [1- 3 marks] Candidates' will evaluate IVF in a limited manner. Their use of appropriate terminology will be limited. Sentences and paragraphs</p>

Question			Answer	Marks	Guidance	
					Content	Levels of response
						<p>are not always relevant, with the material presented in a way that does not always address the question. There may be noticeable errors of grammar, punctuation and spelling and answers may be list like.</p> <p>0 – response not worthy of credit.</p>

Question		Answer	Marks	Guidance	
				Content	Levels of response
4	a	<p><b>Explain the functions of each of the following components of a kidney tubule or nephron.</b></p> <p><b>Glomerulus</b> Site of ultra-filtration. Capillaries specialised with holes to allow rapid movement. Basement membrane prevents exit of blood proteins.</p> <p><b>Bowman's capsule</b> Collects filtrate from glomerulus and channels it into tubule. Inner surface allows rapid movement of materials into nephron. Outer surface is impermeable to prevent fluids escaping.</p> <p><b>Proximal tubule</b> Specialised cells allow uptake of essential nutrients and water back into the blood. Site of active uptake, diffusion and osmosis.</p> <p><b>Loop of Henle</b> Allows movement of water into blood and salts from urine into medulla creating a hypertonic/salty environment</p> <p><b>Collecting duct</b> Acts under influence of hormone ADH to allow water in urine to flow into the medulla and back into the blood if the body is becoming dehydrated. Remains impermeable to water if body too hydrated. Accept movement of urine to ureters/pelvis/bladder. Do not accept urethra.</p>	10	Two marks for each component. One mark for basic point, second for amplification.	

Question		Answer	Marks	Guidance	
				Content	Levels of response
4	b	<p><b>Explain a possible cause of a named renal dysfunction and how this condition may be treated.</b></p> <p><b>Nephrotic syndrome</b></p> <p>Cause: Thought immune system attacks tissues of glomerulus/Bowman's capsule destroying the basement membrane and podocytes causing blood proteins to leak out into urine.</p> <p>Treatment: Diuretics to remove oedema. Steroids to reduce inflammation and immune damage. Immunosuppressants to reduce effect of immune System</p> <p><b>Kidney stones</b></p> <p>Cause: Build-up of calcium/ammonia/uric acid/cysteine. Formation of crystals. Block kidney tubules/ureters. Not drinking enough Eating a protein rich diet. Inactive lifestyle, susceptibility to infections and having Crohn's disease.</p> <p>Treatment: Pass naturally. Painkillers. Lithotripsy using X-rays or ultrasound. Break stones down. 'Key hole' surgery to break up stones by</p>	10	<p>Level 3 Fully developed explanation. Accurate terminology. High QWC.</p> <p>Level 2 Sound explanation. Accurate terminology. Mid-QWC.</p> <p>Level 1 Basic explanation. Limited use of terminology. Low-QWC.</p> <p>Candidates may simply refer to 'kidney failure'. Technically all the supplied examples can lead to this term being applied. Candidates may refer to acute and chronic kidney failure. Concrete examples of cause and treatment will need to be stated. Accept all appropriate examples.</p> <p>Candidates may refer to dialysis. Accept if the candidates describe the method of use.</p> <p>To get higher marks candidates must explain both causes and treatments not just state them.</p>	<p>Level 3 [8 - 10 marks] Candidates will provide a fully developed explanation that includes accurate terminology and follows a logical sequence. Both cause and treatment must be covered. Sentences and paragraphs are relevant with accurate use of appropriate terminology. There may be occasional errors of grammar, punctuation and spelling.</p> <p>Level 2 [5 - 7 marks] Candidates will provide an explanation that includes accurate terminology. Both cause and treatment should be covered. Sentences and paragraphs are generally relevant but may have minor inaccuracies or lack clarity and depth of understanding. There may be some errors of grammar, punctuation and spelling.</p> <p>Sub-max of 5 if only cause or treatment covered.</p> <p>Level 1 [1 - 4 marks] Candidates will provide a limited explanation. Their use of appropriate terminology will be</p>

Question			Answer	Marks	Guidance	
					Content	Levels of response
			<p>laser or cut out surgically.</p> <p><b>Kidney infection</b></p> <p>Cause: Bacteria eg. E. coli from gut passed into urethra and up through bladder. More common in women due to shorter urethra. Un-protected sex</p> <p>Treatment: Full course of antibiotics. Work by interfering with bacterial metabolism and preventing them from multiplying. May have to be intravenous in hospital. Painkillers. Plenty of fluids.</p> <p><b>Kidney failure</b> – this is a potential end result of any of the conditions identified above.</p> <p>Causes therefore as listed</p> <p>Treatment –dialysis either short term or long term. If kidney failure is due to permanent damage then transplant if match available.</p>			<p>limited. Sentences and paragraphs are not always relevant, with the material presented in a way that does not always address the question. There may be noticeable errors of grammar, punctuation and spelling and answers may be list like.</p> <p>0 – response not worthy of credit.</p>

Question	Answer	Marks	Guidance	
			Content	Levels of response
5	<p><b>Evaluate the effect of alcohol on an individual's health and well-being.</b></p> <p>Benefits of <b>moderate</b> alcohol consumption Candidates need to qualify what moderate may mean eg. One to two small glasses of red wine a day. May make reference to 'Mediterranean diet'.</p> <p><b>Benefits to health:</b> Raises HDL levels and so reduces likelihood of coronary heart disease. Increases sensitivity to insulin Reduces risks of small blood clots/'thins' the blood Longer life Can prevent erectile dysfunction Can stimulate immune system Reduces risk of gallstones/diabetes/dementia Improves digestion</p> <p><b>Benefits to well-being:</b> Reduces stress Can be a social activity Can increase creativity Can remove inhibitions.</p> <p><b>Harmful effects on health:</b> High blood pressure Weight gain –may lead to diabetes/CHD/ Stroke Liver cirrhosis Dehydration</p>	20	<p>Level 4 In-depth evaluation. Positives and negatives should be present to achieve top level. Includes both health and well-being. Accurate terminology. High QWC.</p> <p>Level 3 Sound evaluation. Includes both health and well-being. Concentrates on negative aspects. Accurate terminology. High/mid-QWC.</p> <p>Level 2 Attempt at evaluation. Likely to concentrate on negative effects and health aspects. Some terminology. Mid/low-QWC.</p> <p>Level 1 Basic evaluation. List like or vague references to PIES. Limited terminology. Low QWC.</p> <p>Bullet points will indicate identification unless they are fully formed descriptions/explanations. This may only take them as far as the second mark band</p>	<p>Level 4 [16-20] Candidates will evaluate in depth the effect of alcohol on both health (effects on body systems) and well-being (PIES). Both positive and negative aspects need to be included. They will demonstrate the ability to present their answer in a well-planned and logical manner, with a clearly defined structure. They will use appropriate physiological terminology confidently and accurately. Sentences and paragraphs will directly address the question in a consistent, relevant and well-structured way. There will be few, if any, errors in the use of grammar, punctuation and spelling.</p> <p>Level 3 [11-15] Candidates will evaluate soundly the effect of alcohol on both health and well-being. There may be some reference to positive effects but answers are likely to concentrate on the negative. They will demonstrate the ability to present their answer in a planned and logical sequence using some appropriate and accurate physiological terminology. Sentences and paragraphs are for</p>

Question			Answer	Marks	Guidance	
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			<p>Mouth/throat/oesophageal cancer            Irregular heart beat/damage to heart muscle            Fatigue            Disturbed sleep            Sexual problems/infertility            Damage to unborn child/birth defects/foetal alcohol dependency            Slower reaction times            Reduced immunity            Memory problems similar to dementia            Pancreatitis            Affects balance (cerebellum)</p> <p><b>Harmful effects on well-being:</b>            Reduction of inhibitions can make individuals annoying – lose friends            Alcohol may become an emotional ‘crutch’            Increases tendency to argue –affects relationships            Increases tendency to violence –affects relationships            Removes process of clear judgement and ‘risk assessment’ – can result in dangerous situations/injuries/death            Can reduce inhibitions so far that put at risk of sexual abuse/sexual infections/pregnancy</p>			<p>the most part relevant and material will be presented in a balanced, logical and coherent manner that addresses the question. There may be occasional errors in the use of grammar, punctuation and spelling.</p> <p>Sub max of 10 if only health or well-being analysed.</p> <p>Level 2 [6-10]            Candidates will attempt to evaluate the effect of alcohol. Answers are likely to concentrate on health and the negative effects. They will demonstrate limited ability to organise their answer. Sentences and paragraphs will not always be relevant and material will be presented in a way that does not always address the question. There may be some errors of grammar, punctuation and spelling.</p> <p>Level 1 [0-5]            Candidates are likely to simply describe the effects of alcohol and dwell on aspects of <b>PIES</b> or provide vague non-scientific statements. Sentences and paragraphs have limited coherence and structure, with little</p>

Question			Answer	Marks	Guidance	
					Content	Levels of response
						relevance to the main focus of the question. Errors in the use of grammar, punctuation and spelling may be noticeable and obtrusive.  0 – response not worthy of credit.

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