

# **Health and Social Care**

Advanced GCE

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

## **Mark Scheme for January 2011**

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Question		Expected Answer	Mark	Rationale / Additional Guidance
1	(a)	<p><b>One</b> mark for each structure identified, <b>Seven</b> required from:</p> <ol style="list-style-type: none"> <li>1 liver</li> <li>2 gall bladder / biliary system / bile ducts</li> <li>3 common bile duct</li> <li>4 duodenum / small bowel small intestine</li> <li>5 oesophagus / gullet</li> <li>6 stomach</li> <li>7 pancreas</li> </ol>	<p><b>7x1</b></p> <p><b>[7]</b></p>	<p>Minor errors in spelling are acceptable</p>
1	(b)	<p>Candidate will describe the functions of the following listed structures. <b>One</b> mark for each correct function. <b>Two</b> functions required for each structure.</p> <p><b>Stomach</b></p> <ul style="list-style-type: none"> <li>• muscular sac that moves to mix food and digestive chemicals / enzymes</li> <li>• transfers food into small bowel by peristaltic waves / contractions / squeezing movements</li> <li>• creates a mixture called chyme</li> <li>• contracts violently during vomiting</li> <li>• absorbs / sugars / water / alcohol</li> <li>• produces HCl to aid digestion</li> <li>• digestion by digestive enzymes</li> <li>• stores food</li> <li>• secretes pepsin</li> <li>• chemical digestion of protein</li> </ul> <p><b>Pancreas</b> Production of:</p> <ul style="list-style-type: none"> <li>• pancreatic / digestive juices</li> <li>• produces alkaline fluid</li> <li>• produces insulin</li> </ul>	<p><b>4x2</b></p> <p><b>[8]</b></p>	<p>The question asks for a 'description', therefore, a short phrase or a short sentence is required.</p> <p>Sub max of 4 for one word responses</p>

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<ul style="list-style-type: none"> <li>• enzymes</li> <li>• glucagon</li> <li>• somatostatin</li> <li>• pancreatic polypeptide</li> <li>• trypsinogen</li> <li>• pancreatic lipase</li> <li>• water</li> <li>• salts</li> <li>• sodium bicarbonate</li> <li>• protein digesting enzymes</li> <li>• carbohydrate digesting enzymes</li> </ul> <p><b>Small Intestine</b></p> <ul style="list-style-type: none"> <li>• digests and absorbs fats and lipids</li> <li>• absorbs vitamins /nutrients</li> <li>• absorbs water</li> <li>• digests / absorbs carbohydrates / proteins</li> <li>• absorbs monosaccharide / electrolytes</li> <li>• secretes enzymes</li> <li>• contains bowel flora that aid digestion</li> </ul> <p><b>Rectum</b></p> <ul style="list-style-type: none"> <li>• moves contents by muscular waves</li> <li>• forms faeces / stools</li> <li>• secretes mucus</li> <li>• stores prior to defaecation</li> </ul> <p>Accept any other acceptable functional response</p>		

Question		Expected Answer	Mark	Rationale / Additional Guidance
1	(c)	<p><b>Level 3 [5 marks]</b> Candidates will provide a fully developed description that includes accurate terminology and follows a logical sequence. Answer is supported by use of accurate description of the treatment of the digestive system. Sentences and paragraphs are relevant with accurate use of appropriate terminology. There may be occasional errors of grammar, punctuation and spelling.</p> <p><b>Level 2 [3-4 marks]</b> Candidates will provide a developed description that includes accurate terminology. The description of the treatment will be generally relevant but may have minor inaccuracies or lack clarity and depth of understanding. There may be occasional errors of grammar, punctuation and spelling.</p> <p><b>Level 1 [0-2 marks]</b> Candidates' will describe the dysfunction of the digestive system 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 and intrusive errors of grammar, punctuation and spelling and answers may be list like and muddled.</p> <p><b>IBS</b></p> <ul style="list-style-type: none"> <li>• food intolerance is gaining ground as a possible cause for IBS symptoms in many people; change of diet, avoiding products that affect the condition</li> <li>• sufferers find that by cutting out particular types of food such as dairy, caffeine or gluten they reduce their symptoms</li> <li>• stress reduction, changes to lifestyle</li> </ul>	[5]	<p>Candidates will not always use the phrases as printed. Marks will be given for the general principle of the treatment.</p> <p>Use of drug name not essential, can be replaced by the type and action.</p>

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<ul style="list-style-type: none"> <li>• sufferers are often given anti-spasmodic drugs such as Mebeverine to try to calm the spasms in the gut</li> <li>• imodium is a popular drug for diarrhoea and is effective, but more for occasional use than as a long-term solution</li> <li>• laxatives you may be given for constipation include Lactulose and magnesium oxide solution (milk of magnesia)</li> <li>• anti-depressants can actually be helpful to IBS sufferers as they have recognised gastrointestinal effects</li> <li>• calcium supplements, specifically calcium carbonate, can be used by diarrhoea sufferers as they can have a constipating effect</li> <li>• hypnotherapy is a fairly well-established treatment for IBS</li> <li>• complementary medicine, of which there are a variety, including acupuncture and reflexology, accept any valid response</li> <li>• surgery is rare unless the colon has become dysfunctionate or spastic</li> </ul> <p><b>Ulcers (Gastric &amp; Duodenal)</b></p> <ul style="list-style-type: none"> <li>• gastric ulcers can be treated by a partial gastrectomy, which is a removal of the area surrounding the ulcer; duodenal ulcers can be treated by vagotomy, which involves cutting of the vagus nerve to reduce gastric output</li> <li>• antacids to neutralise existing acid in the stomach</li> <li>• acid suppressants like histamine2-receptor antagonists (blockers); histamine is a chemical released in the body under many different conditions; in the stomach it can release more acid, so blocking its action reduces acid production</li> </ul>		

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<ul style="list-style-type: none"> <li>• medicines called proton pump inhibitors also work on the cells in the stomach to reduce the production of acid</li> <li>• these treatments are used in combination with antibiotics if <i>Helicobacter pylori</i> infection is involved, which is in more than 90% of cases; it should be noted that some patients have <i>Helicobacter pylori</i> without peptic ulceration</li> <li>• there is no conclusive evidence that dietary restriction and bland diets play a role in ulcer healing</li> <li>• no proven relationship exists between ulcers and the intake of coffee and alcohol; however, as coffee stimulates acid secretion, and alcohol can cause inflammation of the stomach lining (gastritis), moderation in alcohol and coffee consumption is often recommended for patients with ulcers</li> </ul> <p><b>Gall Stones</b></p> <ul style="list-style-type: none"> <li>• if gallstones have been discovered incidentally and are not troublesome the doctor may want to adopt and watch and see policy; some people may have no symptoms, or just one mild attack of pain and no further trouble, while others have continuing problems</li> </ul> <p><b>Removal of the gallbladder</b></p> <ul style="list-style-type: none"> <li>• The gallbladder is usually removed by keyhole surgery and the operation is called a laparoscopic cholecystectomy. A general anaesthetic is given with very small incisions needed in the abdomen, which enable the surgeon to pass through fine instruments and a tube with a camera on the end. The instruments are controlled by the doctor watching a TV screen. The gallbladder is removed through a cut in your navel. Most people are allowed home the following day, though some are discharged later the same day.</li> </ul>		

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<p>Generally people are back to normal activities within two weeks.</p> <p><b>Other types of operations</b></p> <ul style="list-style-type: none"> <li>• Sometimes it is not possible to remove the gallbladder by keyhole surgery and about 1 in 10 people need a more traditional operation, which requires a longer stay in hospital and approximately 6 weeks convalescence. A few surgeons perform an operation called a mini-laparotomy cholecystectomy, which uses special instruments and requires only a small cut.</li> </ul> <p><b>Via ERCP examination</b></p> <ul style="list-style-type: none"> <li>• Sometimes stones, which have passed into the bile duct and cause infection or jaundice, can be removed during an ERCP examination. This is done by widening the opening to the bile duct with an electrically heated wire (diathermy). The stones are removed or left to pass into your intestine. Sometimes a short plastic tube called a stent is left in the bile duct to help bile drain out. The stent may remain in place permanently or be removed at a later date.</li> </ul> <p><b>Other treatments</b></p> <ul style="list-style-type: none"> <li>• Other methods to remove stones such as dissolving them with drugs or breaking them up with shock wave treatment (Lithotripsy) are now only used occasionally.</li> <li>• Modification of diet to exclude fatty foods to reduce symptoms.</li> </ul> <p><b>Coeliac Disease</b></p> <ul style="list-style-type: none"> <li>• avoidance of gluten / wheat, barley, rye products</li> <li>• use of gluten free products</li> </ul>		

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<ul style="list-style-type: none"><li>• close examination of food labels</li><li>• alternative sources / supplements of iron, calcium</li><li>• ensuring food preparation is free of gluten</li></ul> <p>Where other disorders have been given, for example diabetes, crohn's and ulcerative colitis, these may be accepted.</p>		

Question		Expected Answer	Mark	Rationale / Additional Guidance
2	(a)	<p><b>Level 3 [8-9 marks]</b> Candidates will provide a fully developed description that includes accurate terminology and follows a logical sequence. Sentences and paragraphs are relevant with accurate use of appropriate terminology. There will be few, if any, errors of grammar, punctuation and spelling.</p> <p><b>Level 2 [5-7 marks]</b> Candidates will provide a developed description that includes accurate terminology. Sentences and paragraphs are generally relevant but may have minor inaccuracies or lack clarity and depth of understanding. There may be occasional errors of grammar, punctuation and spelling.</p> <p><b>Level 1 [0-4 marks]</b> Candidates' will describe 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 and intrusive errors of grammar, punctuation and spelling and answers may be list like and muddled. The inclusion of incorrect structures if intrusive will limit the answer to level 1.</p> <p><b>Flow and valves</b> Candidates will describe the flow in sentence form using the structures in the following order.</p> <ul style="list-style-type: none"> <li>• vena cava</li> <li>• right atrium</li> <li>• tricuspid valve/ atrio-ventricular valve</li> <li>• right ventricle</li> <li>• pulmonary semi lunar valve</li> <li>• pulmonary artery (to lungs)</li> </ul>	[9]	For level 3 all structures must be identified in the correct sequence.

Question		Expected Answer	Mark	Rationale / Additional Guidance
		<ul style="list-style-type: none"> <li>• pulmonary vein into left atrium</li> <li>• bicuspid valve/ atrio-ventricular valve</li> <li>• left ventricle</li> <li>• aortic semilunar valve</li> <li>• aorta</li> </ul>		
2	(b)	<p><b>One</b> mark for each, THREE required from</p> <p><b>P wave</b></p> <ul style="list-style-type: none"> <li>• electrical reading from atrial contraction / systole</li> <li>• both the left and right atria contract simultaneously</li> <li>• contraction of atrium / atrial contraction</li> </ul> <p><b>Q R S waves</b></p> <ul style="list-style-type: none"> <li>• represents the small horizontal (left to right) current as the action potential travels through the interventricular septum</li> <li>• electrical reading from: contraction of the left and right ventricles</li> <li>• the contraction of the myocardium itself</li> <li>• contraction of ventricle / ventricular contraction</li> </ul> <p><b>T wave</b></p> <ul style="list-style-type: none"> <li>• represents the repolarisation of the ventricles</li> <li>• or relaxation of heart muscle</li> <li>• relaxation of ventricles</li> </ul>	<p><b>3x1</b></p> <p><b>[3]</b></p>	

Question		Expected Answer	Mark	Rationale / Additional Guidance
2	(c)	<p><b>Level 3 [7-8 marks]</b> Candidates will provide a fully developed description of method(s) of diagnosing cardiac dysfunction that includes accurate terminology and follows a logical sequence. Answer is supported by use of accurate description of the method. Sentences and paragraphs are relevant with accurate use of appropriate terminology. There will be few, if any, errors of grammar, punctuation and spelling.</p> <p><b>Level 2 [4-6 marks]</b> Candidates will provide a description of methods(s) of diagnosing cardiac dysfunction. The description of the method will be accurate. Sentences and paragraphs are generally relevant but may have minor inaccuracies or lack clarity and depth of understanding. There may be occasional errors of grammar, punctuation and spelling.</p> <p><b>Level 1 [0-3 marks]</b> Candidates' will describe a method of diagnosing cardiac dysfunction 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 and intrusive errors of grammar, punctuation and spelling and answers may be list like and muddled.</p> <p><b>Clinical Observation</b></p> <ul style="list-style-type: none"> <li>• sweating</li> <li>• pallor</li> <li>• chest pain</li> <li>• radiating arm pain / neck pain</li> <li>• diarrhoea / vomiting</li> </ul>	[8]	CAT and MRI are not acceptable as first line diagnosis.

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<p><b>Blood Pressure</b></p> <ul style="list-style-type: none"> <li>• patient sits down and rests their arm so the brachial artery is level with the heart</li> <li>• a sphygmomanometer cuff is wrapped around the subject's upper arm, just above the elbow</li> <li>• a stethoscope is placed on the elbow over the brachial artery</li> <li>• the cuff is pumped- up to a pressure of 180mmHg, compressing the brachial artery</li> <li>• once the systolic pressure has been exceeded there is no flow of blood</li> <li>• the valve on the pump is released to allow the pressure of the sphygmomanometer cuff to decrease</li> <li>• once the systolic pressure is reached the brachial artery opens and can be heard through a stethoscope</li> <li>• as the pressure exerted onto the brachial artery falls the second pulse provides the diastolic pressure</li> </ul> <p><b>Cardiac Ultrasound</b></p> <ul style="list-style-type: none"> <li>• lubricating jelly is rubbed on the chest</li> <li>• a probe (transducer) is then placed on the chest</li> <li>• a pulse of high frequency sound is then passed through the skin</li> <li>• the probe picks up the echoes reflected from various parts of the heart</li> <li>• shows them as an echocardiogram - a picture on the screen</li> <li>• the echocardiogram can give accurate information about the pumping action of the heart, the structure of the heart and the valves</li> <li>• useful test if you have recently had a heart attack</li> <li>• if you have heart failure</li> <li>• used routinely to assess people with disease of the heart valves and</li> </ul>		

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<ul style="list-style-type: none"> <li>• people with congenital heart disease</li> <li>• useful for diagnosing heart disease in newborn babies and infants</li> </ul> <p><b>Angiography</b></p> <ul style="list-style-type: none"> <li>• local anaesthetic in the arm or groin</li> <li>• a guide wire is inserted into an artery in the leg or arm</li> <li>• a <b>catheter</b> (a thin, flexible tube) will be passed along the guide wire into the artery</li> <li>• using an x-ray, the catheter will be directed through the blood vessels and into your heart</li> <li>• a contrast medium / special dye will then be passed through the catheter</li> <li>• a series of <b>x-rays</b> of the heart / arteries will be taken</li> <li>• patient feels a hot, flushing sensation from the contrast / dye</li> <li>• the contrast / dye will show up any narrowed areas or blockages in the artery on the x-ray</li> </ul> <p><b>ECG</b></p> <ul style="list-style-type: none"> <li>• ECG test, the electrical impulses made while the heart is beating are recorded and usually shown on a piece of paper</li> <li>• demonstrates the conduction of the heart beat through the heart which may be affected by underlying heart disease</li> <li>• an ECG can be used to assess if the patient has had a heart attack or evidence of a previous heart attack</li> <li>• an ECG can be used to monitor the effect of medicines used eg for coronary artery disease</li> <li>• an ECG reveals rhythm problems such as the cause of a slow or fast heart beat</li> </ul>		

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<ul style="list-style-type: none"> <li>• to demonstrate thickening of a heart muscle (left ventricular hypertrophy), for example due to long-standing high blood pressure</li> <li>• to see if there are too few minerals in the blood</li> </ul> <p><b>Chest X-ray</b></p> <ul style="list-style-type: none"> <li>• used to demonstrate heart size</li> <li>• can show malformation</li> <li>• can demonstrate pericardial effusions</li> </ul> <p><b>Stethoscope</b></p> <ul style="list-style-type: none"> <li>• used to listen to the blood flow</li> <li>• audible valve sounds may indicate dysfunctions</li> <li>• speed of heart beat indicating dysfunction</li> <li>• ectopic beats</li> <li>• rhythm dysfunction</li> </ul>		

Question			Expected Answer	Mark	Rationale / Additional Guidance
3	(a)		<p><b>One</b> mark for each structure identified, <b>Six</b> required from</p> <ol style="list-style-type: none"> <li>1. Bowman's capsule</li> <li>2. glomerulus</li> <li>3. capillaries / vasa recta</li> <li>4. loop of Henle</li> <li>5. collecting duct / collecting tubule / collecting tube</li> <li>6. convoluted tubule / distal tubule</li> </ol>	<p><b>6x1</b></p> <p><b>[6]</b></p>	Minor errors in spelling are acceptable
3	(b)	(i)	<p><b>Level 3 [6-7]</b> Candidates will provide a fully developed description of how the dysfunction could be diagnosed. They will demonstrate the ability to present their answer in a planned and logical sequence using appropriate and accurate terminology. Sentences and paragraphs are for the most part relevant and material will be presented in a balanced, logical and coherent manner that addresses the question. There will be few, if any, errors of grammar, punctuation and spelling.</p> <p><b>Level 2 [4-5]</b> Candidates will provide a developed description of how the dysfunction could be diagnosed. They will demonstrate limited ability to organise their answer, using some appropriate terminology. 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 occasional errors of grammar, punctuation and spelling.</p> <p><b>Level 1 [0-3]</b> Candidates will identify / describe how the dysfunction could be diagnosed. The description will be limited with little evidence of the use of appropriate terminology. Sentences and paragraphs have limited coherence and structure, with little relevance to the main focus of the question.</p>		Candidates may use a collection of methods.

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<p>Errors in the use of grammar, punctuation and spelling may be noticeable and intrusive. Answers may be list like and muddled.</p> <p><b>Physical examination looking for:</b></p> <ul style="list-style-type: none"> <li>• related pain</li> <li>• pain on micturition</li> <li>• poor skin colour</li> <li>• itchy sensation</li> <li>• poor / excessive urine output</li> <li>• nocturia</li> <li>• haematuria / blood in urine</li> <li>• oedema</li> <li>• itchy eye</li> <li>• hiccups</li> </ul> <p><b>Plain X-rays</b></p> <ul style="list-style-type: none"> <li>• limited value x-rays to show possible renal colic</li> <li>• kidney outline</li> </ul> <p><b>IVP / IVU</b></p> <ul style="list-style-type: none"> <li>• views of the renal system by x-ray</li> <li>• use of contrast / dye to highlight kidney function</li> <li>• shows bladder function</li> <li>• measures time of excretion</li> <li>• transit time measured</li> <li>• demonstrates bladder function</li> <li>• demonstrates prostate size</li> </ul> <p><b>Ultrasound</b></p> <ul style="list-style-type: none"> <li>• lubricating jelly is rubbed on the abdomen,</li> <li>• a probe (transducer) is then placed on the abdomen</li> <li>• a pulse of high frequency sound is then passed through the skin.</li> </ul>		

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<ul style="list-style-type: none"> <li>• the probe picks up the echoes reflected from various parts of the kidney or bladder</li> <li>• shows as a real time picture on the screen.</li> <li>• can give accurate information about structure and function</li> <li>• the structure of the kidneys, ureters and bladder</li> <li>• useful test if you have renal stones</li> <li>• cannot diagnose infection</li> </ul> <p><b>Blood Test</b> A blood sample is taken from a vein in the arm or leg / using a tourniquet / a syringe and needle / and is examined in a laboratory.</p> <p>This test can measure:</p> <ul style="list-style-type: none"> <li>• the number and variety of red and white blood cells</li> <li>• the presence of bacteria or other organisms</li> <li>• the presence of substances, such as glucose or protein / albumin at abnormal levels in the blood</li> <li>• the pH,</li> <li>• urea levels</li> <li>• creatinine levels</li> <li>• ammonia levels</li> </ul> <p><b>Urine Test</b> This test can measure</p> <ul style="list-style-type: none"> <li>• the amount of red and white blood cells</li> <li>• the presence of bacteria or other organisms</li> <li>• the presence of substances, such as glucose / protein / albumin / stones that usually shouldn't be found in the urine</li> <li>• the pH, which shows how acidic or basic the urine is</li> <li>• the concentration of the urine</li> </ul>		

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<p><b>Uroscopy</b></p> <ul style="list-style-type: none"> <li>• optical inspection by a physician of a patient's urinary system</li> <li>• procedure can be painful, although it is typically perform under sedation</li> <li>• allows the doctor to look at the interior inside layer of the bladder and the urethra</li> <li>• by using a thin / lighted / flexibility / fibre optic scope inserted through the urethra and into the bladder.</li> <li>• It can diagnose stones / tumours / bleeding / infection and other reason for pain.</li> <li>• allows the introduction of tiny surgical instruments through the scope</li> <li>• allows biopsy sample to be taken</li> </ul> <p>Candidates can choose to describe more than one method for the overall diagnosis</p>		

Question			Expected Answer	Mark	Rationale / Additional Guidance
3	(b)	(ii)	<p><b>Level 3 [6-7]</b> Candidates will provide a comprehensive description of the physiological effects of a renal dysfunction. They will demonstrate the ability to present their answer in a planned and logical sequence using appropriate and accurate terminology. Sentences and paragraphs are for the most part relevant and material will be presented in a balanced, logical and coherent manner that addresses the question. There will be few, if any, errors of grammar, punctuation and spelling.</p> <p><b>Level 2 [4-5]</b> Candidates will provide a detailed explanation of the physiological effects of a renal dysfunction. They will demonstrate limited ability to organise their answer, using some appropriate terminology. 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 occasional errors of grammar, punctuation and spelling.</p> <p><b>Level 1 [0-3]</b> Candidates will identify / describe the physiological effects of a renal dysfunction. The description will be limited with little evidence of the use of appropriate terminology. Sentences and paragraphs have limited coherence and structure, with little relevance to the main focus of the question. Errors in the use of grammar, punctuation and spelling may be noticeable and intrusive. Answers may be list like and muddled.</p>	[7]	<p>As the dysfunction is based around a single system many symptoms and effects are common to the different dysfunctions. They can therefore be swapped about where appropriate</p> <p><b><i>Any other valid point.</i></b></p>

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<p><b>Dysfunctions</b></p> <ul style="list-style-type: none"> <li>• renal failure or impaired function due to external influences or neoplasm</li> <li>• renal infection / urinary infection</li> <li>• renal calculi</li> <li>• prostate dysfunction</li> </ul> <p><b>Renal Failure</b></p> <ul style="list-style-type: none"> <li>• renal failure is the decrease or cessation of glomerular filtration where the kidneys almost entirely or abruptly stop working</li> <li>• the main feature is the suppression of urine flow characterised by scanty urine production</li> <li>• daily urine output will be between 50 and 250 ml</li> <li>• renal failure will cause oedema due to salt and water retention</li> <li>• acidosis due to the kidneys inability to excrete acidic substances</li> <li>• increased levels of urea in the blood elevated potassium levels, cardiac arrest and anaemia</li> <li>• poor absorption of calcium due to no vitamin D conversion in the kidney</li> <li>• effects can be fever / high temperature</li> <li>• in severe cases, high blood, creatinine and ammonia known as uraemia</li> <li>• this can give nausea, vomiting, hiccups and loss of appetite</li> <li>• patient may develop yellow – brown skin discolouration</li> <li>• pericarditis and high blood pressure coupled with neuropathy twitching and lack of concentration</li> </ul>		

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<p><b>Renal Infection</b></p> <ul style="list-style-type: none"> <li>• is where any part of the urinary system is attacked and affected by bacteria or viruses</li> <li>• this can lead to impaired function, production of malodorous urine or infected discharges from the system</li> <li>• the body may be affected by fever, rigors, rashes and joint pain</li> <li>• if candidates are explaining STI's then they may comment on burning sensation when passing urine and latent effects such as infertility and heart and brain problems in tertiary syphilis</li> </ul> <p><b>Renal Calculi / Colic</b></p> <ul style="list-style-type: none"> <li>• this is the production of stones, gravel or small lakes of Calcium in crystalline form</li> <li>• they can be present in any part of the urinary system and can lead to impeded flow of urine, excruciating pain, in severe cases renal failure</li> <li>• cause is generally unknown and can be a family trait</li> <li>• effects can be fever / high temperature</li> <li>• in severe cases, high blood urea, creatinine and ammonia known as uraemia</li> <li>• this can give nausea, vomiting, hiccups and loss of appetite</li> <li>• patient may develop yellow – brown skin discolouration</li> <li>• pericarditis and high blood pressure coupled with neuropathy twitching and lack of concentration</li> <li>• blood in the urine due to abrasion</li> </ul>		

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<p><b>Prostate</b></p> <ul style="list-style-type: none"> <li>• can be enlarged, infected, calcified, dysfunctional or infiltrated with cancer</li> <li>• this can cause urinary retention, pain frequency, hesitancy and retrograde ejaculation and burning sensations</li> <li>• inflammation and infections can set in</li> <li>• nocturia dysurea, incomplete emptying and bleeding also common</li> <li>• with acute urinary retention you often get many of the symptoms associated with uraemia</li> <li>• neoplasms can be benign or malignant. Malignancies can spread to the live lung, bone and brain</li> </ul> <p><b>Nephrotic syndrome</b></p> <ul style="list-style-type: none"> <li>• decrease in blood albumin levels resulting in slowed water uptake leading to oedema</li> <li>• damage to glomerular bowmans interface resulting in loss of albumin, antibodies and blood proteins.</li> <li>• Increased susceptibility to infections especially chicken pox</li> <li>• increased clotting time</li> </ul> <p><b>Effects may include</b></p> <ul style="list-style-type: none"> <li>• pain</li> <li>• vomiting</li> <li>• cloudy urine</li> <li>• pain on urinating (if appropriate)</li> </ul>		

Question		Expected Answer	Mark	Rationale / Additional Guidance
4	(a)	<p><b>One</b> mark for each structure identified, FIVE required from</p> <ol style="list-style-type: none"> <li>1. ovary / ova / ovum / eggs</li> <li>2. fallopian tube / ovi duct</li> <li>3. vagina</li> <li>4. cervix / neck of womb / os</li> <li>5. uterus / womb / endometrium</li> </ol>	<p><b>5x1</b></p> <p><b>[5]</b></p>	Minor errors in spelling are acceptable
4	(b)	<p><b>Level 3 [6 - 7 marks]</b> Candidates will provide a fully developed description of at least two cause of infertility that includes accurate terminology and follows a logical sequence. Sentences and paragraphs are relevant with accurate use of appropriate terminology. There will be few, if any, errors of grammar, punctuation and spelling.</p> <p><b>Level 2 [4 - 5 marks]</b> Candidates will provide a sound description of at least one cause of infertility that includes accurate terminology. The description of the treatment will be accurate. Sentences and paragraphs are generally relevant but may have minor inaccuracies or lack clarity and depth of understanding. There may be occasional errors of grammar, punctuation and spelling. <i>Sub max of 4 for one area developed well.</i></p> <p><b>Level 1 [0-3 marks]</b> Candidates' will describe one cause of infertility 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 and intrusive errors of grammar, punctuation and spelling and answers may be list like and muddled.</p>	<b>[7]</b>	Only female related dysfunction.

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<p><b>Candidate will describe the dysfunction chosen. These may include</b></p> <ul style="list-style-type: none"> <li>• Infertility due to: hormonal / infection / hereditary / deformity / chemical influences</li> <li>• ectopic pregnancy</li> <li>• polycystic ovary disease</li> </ul> <p><b>Infertility</b> - description will relate to:</p> <ul style="list-style-type: none"> <li>• the viability of the egg cell</li> <li>• infertile due to drug usage / radiotherapy / injury / deformity</li> <li>• two cells may not meet at the right point</li> <li>• uterine chemistry could destroy the sperm</li> <li>• fallopian tubes could be blocked due to infection</li> <li>• egg could be released into the body cavity and not the fimbriated end of the Fallopian tube</li> <li>• cervical mucus too thick / hostile</li> <li>• failure to ovulate</li> <li>• infertility due to anorexia</li> <li>• hormone levels and blood chemistry in balance</li> </ul> <p>Any other acceptable answer.</p> <p><b>Infertility caused by Ectopic pregnancy</b></p> <ul style="list-style-type: none"> <li>• egg cell is released and becomes fertilised in the fallopian tube</li> <li>• instead of implanting in the uterus it attempts to implant in the F tube</li> <li>• will not go to full term due to lack of blood supply</li> <li>• ruptures the tube stopping any further eggs</li> <li>• subsequent repair reduces the patency of the tube</li> <li>• eggs cannot pass along the tube</li> </ul>		

Question		Expected Answer	Mark	Rationale / Additional Guidance
		<p><b>Life style causes</b></p> <ul style="list-style-type: none"> <li>• excessive consumption of alcohol</li> <li>• smoking causing atheroma in small blood vessels in reproductive system</li> <li>• sexually transmitted infections causing inflammation and atrophy</li> <li>• poor diet and lack of vitamins and minerals causing physiological dysfunction</li> <li>• anorexia and low body fat (cholesterol) levels reducing effective blood cholesterol</li> </ul>		
4	(c)	<p><b>Level 3 [7-8 marks]</b> Candidates will provide a fully developed description of both diagnosis and treatment that includes accurate terminology. Sentences and paragraphs are relevant with accurate use of appropriate terminology. There will be few, if any, errors of grammar, punctuation and spelling.</p> <p><b>Level 2 [4-6 marks]</b> Candidates will provide a description of diagnosis and treatment that includes accurate terminology. Sentences and paragraphs are generally relevant but may have minor inaccuracies or lack clarity and depth of understanding. There may be occasional errors of grammar, punctuation and spelling. <i>Sub max of 4 for one well developed description of diagnosis or treatment.</i></p> <p><b>Level 1 [0-3 marks]</b> Candidates' will describe the diagnosis and / or treatment 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 and intrusive errors of grammar, punctuation and spelling and answers may be list like and muddled.</p>	[8]	

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<ul style="list-style-type: none"> <li>• clinical observation</li> <li>• ultrasound</li> <li>• blood / microscopic tests</li> <li>• hystero-salpingogram (Salp, HSG, Salpingogram)</li> <li>• laproscopy</li> </ul> <p>Ultra sound will be used to scan the patient to look for a viable pregnancy, monitor dysfunction or tube implantation. This will be either abdominal or trans-vaginal.</p> <ul style="list-style-type: none"> <li>• ultrasound is a painless procedure that takes between 15 minutes and one hour, depending on what is being examined</li> <li>• the person carrying out the examination is usually an ultrasonographer, a radiographer, midwife or obstetrician; specially trained at ultrasound techniques</li> <li>• for scans of the uterus or pelvis, a full bladder helps to produce better images</li> <li>• a lubricating gel is used to help conduct the sound waves into the body</li> <li>• the ultrasonographer applies the gel to the skin in the area to be examined</li> <li>• a probe, which may look a bit like a thick, blunt pen or sometimes like a mobile phone, is then held against the skin and moved over its surface</li> <li>• this allows views to be seen from different angles.</li> <li>• the probe is attached by a wire to the ultrasound machine and monitor</li> <li>• echoes are detected by the probe and processed by a computer</li> <li>• images of the inside of the body are displayed on the monitor</li> </ul>		

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<ul style="list-style-type: none"> <li>• the image is constantly updated, so the scan can show movement (real time)</li> <li>• this works because sound changes frequency when it encounters a moving object, such as blood flowing in blood vessels (this is called the doppler effect)</li> <li>• the images of the scan are seen on the monitor</li> <li>• permanent copies of the examination can be saved as still pictures which can be printed out</li> <li>• better pictures of the organs to be examined can be obtained if a special probe is used inside the body</li> </ul> <p>Blood test would show any hormonal or chemical changes. Candidates may name specific blood tests eg</p> <ul style="list-style-type: none"> <li>• <b>Follicle Stimulating Hormone (FSH):</b> FSH triggers the follicles within your ovaries to begin preparing for the release an egg. High levels of FSH are generally an indicator that egg reserves are running low, although they also signal an overall imbalance of hormones</li> <li>• <b>Luteinizing hormone (LH):</b> lutenizing hormone controls egg development. During ovulation, levels of LH surge in order to trigger the release of the egg. Consistently high levels of this hormone in your body can prevent this increase, and might also be an indicator of Polycystic Ovary Syndrome</li> <li>• <b>Prolactin:</b> a blood test will also measure levels of prolactin. Prolactin is a stress hormone that is released by the pituitary gland. High levels of prolactin can prevent the release of FSH and LH.</li> </ul> <p>HSG would be used to demonstrate the patency of the FT prior to attempted fertilisation.</p> <ul style="list-style-type: none"> <li>• the woman lies on the table on her back and brings her feet up into a 'frog leg' position</li> </ul>		

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<ul style="list-style-type: none"> <li>• the doctor places a speculum in the vagina and visualizes the cervix</li> <li>• a soft, thin catheter is placed through the cervical opening into the uterine cavity</li> <li>• contrast is slowly injected through the catheter into the uterine cavity</li> <li>• an x-ray picture is taken as the uterine cavity is filling and then additional contrast is injected so that the tubes should fill and begin to spill into the abdominal cavity</li> <li>• more x-ray pictures are taken as this 'fill and spill' occurs</li> <li>• the woman usually remains on the table for a few minutes to recover from the cramping caused by injection of the contrast</li> <li>• the results of the test can be immediately available</li> <li>• one particular test is the <i>anti-sperm antibody</i> test to examine vaginal</li> </ul> <p><b>Laprosopy</b></p> <ul style="list-style-type: none"> <li>• the procedure can last from 15 mins upwards, depending on what type of examination or treatment you need</li> <li>• the doctor will make a cut in your belly button</li> <li>• a plastic tube is inserted and gas is introduced into the abdomen</li> <li>• this expands your abdomen and allows your doctor to see inside with the laparoscope</li> <li>• an alternative method for introducing gas is using a hollow needle</li> <li>• if you need any treatment or surgery, your doctor will make additional small cuts in the lower part of your abdomen to allow access for surgical instruments</li> </ul>		

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<ul style="list-style-type: none"> <li>• the doctor may inject a contrast agent through your cervix into your womb and your fallopian tubes to help show that there is no blockage in your tubes</li> <li>• once the examination is complete, the instruments are carefully taken out and the gas is allowed to escape through the laparoscope</li> <li>• the doctor will close the cuts with stitches</li> <li>• the doctor may insert a catheter to drain urine from your bladder into a bag</li> </ul> <p><b>Treatment</b></p> <p>Infertility treatments</p> <ul style="list-style-type: none"> <li>• IVF is almost always the preferred choice in clinics</li> <li>• drug therapy and hormone therapy:</li> <li>• correcting oestrogen and progesterone levels</li> <li>• <b>Clomid</b> is one of the most commonly prescribed fertility drugs. Though usually used to stimulate ovulation in women</li> <li>• egg harvesting</li> <li>• IVF the embryos are fertilised, observed and raised in a laboratory for 3 to 5 days</li> <li>• womb implantation</li> </ul> <p>Modified versions can be GIFT, ZIFT,</p> <ul style="list-style-type: none"> <li>• the processes used in GIFT and ZIFT are closer to natural conception</li> <li>• in ZIFT, the eggs are placed in the fallopian tubes rather than directly in the uterus</li> <li>• with GIFT, fertilization actually takes place in the body rather than in a petri dish</li> <li>• GIFT and ZIFT both require a surgical procedure that IVF does not</li> </ul>		

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<p><b>Surgery</b> Ectopic pregnancy would require surgical intervention to remove the pregnancy from the tube. This will damage the tube and may lead to infertility. Candidates may also use laparoscopy description to front the surgery.</p> <p><b>Lifestyle Changes</b></p> <p><i>Body Weight</i></p> <ul style="list-style-type: none"> <li>• being overweight or underweight can affect the chances of ovulating normally in a woman. It has been found that women who have 17% to 21% of their total body weight as fat provide the ideal condition for ovulation</li> <li>• overweight women with ovulation and menstrual cycle problems may want to lose some weight if they are having troubles conceiving. Even slightly reducing your weight can increase your chances of conceiving many folds</li> </ul> <p><i>Smoking</i></p> <ul style="list-style-type: none"> <li>• increase the time it takes them to conceive</li> <li>• raise their the risk of spontaneous miscarriage,</li> <li>• jeopardise the health of their baby yet to be born</li> <li>• female smokers are also at a greater risk for delivering premature or low birth weight babies</li> <li>• risk developing pelvic inflammatory disease</li> </ul> <p><i>Alcohol, Caffeine and Drugs</i></p> <ul style="list-style-type: none"> <li>• regularly drinking alcohol can reduce fertility levels by up to 50%</li> <li>• similarly, drugs like marijuana and cocaine have been found to cause disruptions in a woman's menstrual cycle</li> <li>• caffeine reduces the fertility</li> </ul>		

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<p><i>Exercise</i></p> <ul style="list-style-type: none"> <li>• moderate exercise everyday is key to maintaining a healthy body.</li> <li>• Exercise helps to burn off excess body fat and also helps in normalising your hormone levels</li> </ul> <p><i>Healthy Diet</i></p> <ul style="list-style-type: none"> <li>• vitamins C and E play key roles in female fertility</li> <li>• infertility hormonal imbalances can be avoided by removing all processed flours and sugars such as white bread, pasta, sweets, and sugary juices from the diet</li> <li>• eating foods with a low glycemic index such as fruits, vegetables, and beans; lean protein like yoghurt, and walnuts, sesame seeds, and extra virgin oil at every meal helps maintain the hormonal balance in the body and improves the functioning of the reproductive organs</li> <li>• certain herbicides and pesticides sprayed on crops have been found to have drastic effects on fertility</li> </ul>		

Question	Expected Answer	Mark	Rationale / Additional Guidance
5	<p><b>Level 4 [16-20]</b> Candidates will provide a comprehensive discussion of at least two physiological effects that smoking can have on the respiratory system and at least two other body systems 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 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><b>Level 3 [11-15]</b> Candidates will provide a detailed discussion of the physiological effects that smoking can have on the respiratory system and two other body systems They will demonstrate the ability to present their answer in a planned and logical sequence using appropriate and accurate terminology. Sentences and paragraphs are for 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><b>Level 2 [6-10]</b> Candidates will provide a basic discussion of at least one physiological effect that smoking can have on the respiratory system and one other body system. They will demonstrate limited ability to organise their answer, using some appropriate terminology. 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 occasional errors of grammar, punctuation and spelling.</p>		<p>One word responses are not acceptable and are not awarded a mark.</p> <p>The list is not definitive but most responses will be covered by these areas of common effects.</p> <p>For high levels responses physiological effects of specified smoking related toxins would be expected</p>

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<p><b>Level 1 [0-5]</b> Candidates' description and assessment will be limited, with little evidence of the use of appropriate terminology. Sentences and paragraphs have limited coherence and structure, with little relevance to the main focus of the question. Errors in the use of grammar, punctuation and spelling may be noticeable and intrusive. Answers may be list like and muddled.</p> <p><b>Respiratory Conditions</b></p> <ul style="list-style-type: none"> <li>• bronchitis</li> <li>• emphysema</li> <li>• lung cancer</li> <li>• asthma</li> <li>• COPD</li> <li>• COAD</li> <li>• cystic fibrosis</li> </ul> <p><b>Leading to:</b></p> <p><b>Physiological effects</b></p> <ul style="list-style-type: none"> <li>• bronchitis and over production of sputum</li> <li>• emphysema and shortness of breath</li> <li>• lung cancer and secondary deposits</li> <li>• slows and clogs airway cilia</li> <li>• poor lung function and chest pain</li> <li>• lung infections / pneumonia / pleurisy</li> <li>• bronchiectasis</li> <li>• bronchiolitis</li> <li>• pneumothorax and SOB</li> <li>• plural effusions</li> <li>• carbon monoxide poisoning and poor oxygen absorption</li> <li>• cough</li> </ul>		

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<ul style="list-style-type: none"> <li>• alveoli damage</li> <li>• destruction of cilia</li> <li>• hypertension</li> <li>• change in blood gas values</li> <li>• vascular damage</li> <li>• cellular damage</li> </ul> <p><b>Cardiovascular</b></p> <ul style="list-style-type: none"> <li>• increased / irregular heart rate</li> <li>• raised blood pressure / hypertension</li> <li>• arteriosclerosis / plaques / thrombi / clots</li> <li>• increased risk of stroke (CVI) due to clot or bleed</li> <li>• thickening of the blood</li> </ul> <p><b>Genito - Urinary</b></p> <ul style="list-style-type: none"> <li>• infertility due to arterial narrowing</li> <li>• impotence due to poor blood flow</li> <li>• cervical cancer</li> <li>• increased risk of bladder, prostate, cervix cancer</li> <li>• reduced urine output</li> <li>• retention &amp; infections</li> </ul> <p><b>Reproductive</b></p> <ul style="list-style-type: none"> <li>• low birth weight due to CO poisoning</li> <li>• miscarriage</li> <li>• ? SIDS</li> <li>• asthma, respiratory infections</li> <li>• complications with the birth</li> <li>• affected through mothers milk leading to breathing problems, poor lung function, chest infections, bronchitis and pneumonia</li> </ul>		

Question	Expected Answer	Mark	Rationale / Additional Guidance
	<p><b>Digestive</b></p> <ul style="list-style-type: none"><li>• increased gastric acid leading to gastritis and ulceration</li><li>• increased risk of pancreatic cancer</li><li>• reduced appetite</li><li>• cancer of the oesophagus, stomach</li><li>• increased risk of liver and large bowel cancer</li></ul> <p>The above effects may also be linked to physical activity Any other valid response.</p>		

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