

PTS Phase 1 Mock SAQ 2023

Paper 1 – [Questions]



Examiner Instructions:

- Time allocated for examination: 2 hours.
- You are **not permitted** to leave the examination hall in the first 90 minutes and last 10 minutes.
- You are permitted to use a Sheffield University approved calculator should you wish.
- The use of mobile phones or other electronic devices is **strictly prohibited** in this exam and should be handed in or switched off for the duration of the exam.
- Please complete all 12 questions
- The paper consists of 120 marks total.

Disclaimer:

The following paper has been written **for students by students** and bears no reflection on the real exam. This is a learning tool that has not been reviewed by the University of Sheffield and therefore the use of this paper for learning are at the student's discretion.

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(Question 1)

Mr Smith is a 57 year old man who comes to see you, his GP, complaining of epigastric pain after eating. This has been going on for around 3 months. After taking a thorough history, you diagnose Mr Smith with gastro-oesophageal reflux (GORD) and commence the appropriate treatment. (10 Marks)

- 1. What is the histological change Mr Smith is at risk of, and what is the potential change seen? (3 Marks)**
 - 2. What do D cells produce and their function? (2 Marks)**
 - 3. Name 2 forms of mucosal defence (2 Marks)**
 - 4. Which artery supplies the greater curvature of the stomach? (1 Mark)**
 - 5. Name 2 risk factors for GORD? (2 Marks)**
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(Question 2)

Miss Green is a 23 year old female coming to see her GP with a 6 month history of diarrhoea, blood and mucus in her stool, weight loss and fatigue. After the appropriate tests, Miss Green is diagnosed with Crohn's disease and commenced on the appropriate treatment. (10 Marks)

- 1. Miss Green was found to have extensive disease in her small bowel, particularly her ileum. She is at risk of vitamin B12 deficiency, how is this vitamin absorbed, and name one function? (3 Marks)**
- 2. Name 3 macroscopic differences between the large and small bowel (3 marks)**
- 3. Name 3 structures which make up the hind gut (3 marks)?**
- 4. Which vessel supplies the ascending colon? (1 Mark)**

(Question 3)

Mr Smith is a 87 year old man with rigidity, bradykinesia and tremor presents to the neurology clinic. (10 Marks)

- 1. Which parts of the basal ganglia comprise the striatum? (2 Marks)**
 - 2. Name 2 cortical loops of the basal ganglia. (2 Marks)**
 - 3. Which neurotransmitter is produced in the substantia nigra? (1 Mark)**
 - 4. What pigmented hormone is present in the skin and what type of cell is it produced by? (2 Marks)**
 - 5. Name 2 motor related conditions and 1 psychiatric condition associated with the basal ganglia. (3 Marks)**
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(Question 4)

Miss Green is a 32 year old woman presenting with occasional vision loss, which is particularly worse after a hot shower, fatigue and numbness in her arms and legs. Following an MRI scan, she is diagnosed with Multiple Sclerosis. (10 Marks)

- 1. What is the role of the myelin sheath. (2 Marks)**
- 2. Which cells are responsible for myelination in the peripheral nervous system and the central nervous system? (4 Marks)**
- 3. Multiple sclerosis occurs due to a loss in the myelin sheath of neurons. Describe how this can cause symptoms to occur. (2 Marks)**
- 4. What could be seen on MRI to diagnose MS? (2 Marks)**

(Question 5)

A 75-year-old lady presents with progressive shortness of breath, ankle swelling and chest pain on exertion. She is diagnosed with heart failure. (10 Marks)

- 1. Define preload (1 Mark)**
 - 2. Define Starling's law (2 Marks)**
 - 3. How is cardiac output calculated? (1 Mark)**
 - 4. Name the two main arteries that branch directly from the left coronary artery (2 Marks)**
 - 5. Describe the normal conduction pathway through the heart, including contraction of the atria and ventricles (3 Marks)**
 - 6. What is the effect of the parasympathetic nervous system on cardiac output (1 Mark)**
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(Question 6)

Mr Green presents with oedema of his ankles and feet, increased frequency of passing urine and haematuria, he is subsequently diagnosed with Chronic kidney disease. (10 Marks)

- 1. Define glomerular filtration rate (GFR). (3 Marks)**
- 2. Name 3 molecules absorbed in the ascending loop of Henle. (3 Marks)**
- 3. Name the two different cells that make up the collecting tubule and their function. (4 Marks)**

(Question 7)

Mr Ronald, a 75 year old man, goes to see his GP as he has been going to the toilet a lot more frequently. A blood test reveals that his HbA1c is 75, indicating that he has diabetes mellitus. (10 Marks)

- 1. At what anatomical level can the pancreas usually be found? (1 Mark)**
 - 2. What cell type in the pancreas is responsible for the secretion of insulin? (1 Mark)**
 - 3. What are the two stages in the biphasic secretion of insulin? (2 Marks)**
 - 4. Binding of insulin to receptors on the surface of muscle and fat cells stimulates mobilisation to the plasma membrane of what transporters? (1 Mark)**
 - 5. What two processes does glucagon stimulate in the liver? (2 Marks)**
 - 6. Describe the effect of cortisol on insulin + glucagon, and the consequent effect on blood glucose (3 Marks)**
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(Question 8)

Adam Stratford is a 27 year old man with a history of IV drug use. He has come to the GP after experiencing symptoms of fever, vomiting, and pain in the upper right quadrant of the abdomen. You also notice yellowing of the skin and eyes. You order a blood test which confirms a diagnosis of hepatitis B. (10 Marks)

- 1. What compound causes the yellowing of the skin seen in jaundice and how is it synthesised? (3 marks)**
- 2. What are 5 functions of the liver? (5 marks)**
- 3. What vessel supplies the liver with the majority of its blood supply? (1)**
- 4. What ligament connects the liver to the anterior abdominal wall? (1)**

(Question 9)

Mr Ahmed is a 45 year old man who has recently been in a work accident where he was hit on the head. He has not attended A&E as he “did not have the time to wait” but he has presented to A&E with numerous symptoms 2 days later. An X-ray suggests he has damage to his cribriform plate and superior orbital fissure. (10 Marks)

- 1. What nerve may be affected if the cribriform palate is damaged and what would the effect of this nerve damage be? (2 Marks)**
 - 2. What 4 nerves pass through the superior orbital fissure? (4 Marks)**
 - 3. What nerve is responsible for elevating the eyelid and what muscle is used to elevate the eyelid? (2 Marks)**
 - 4. What are 2 other nerves associated with the eye? (2 Marks)**
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(Question 10)

Mrs Collins has recently given birth to her daughter who she has now brought into the GP practice to investigate a wheezing episode. She is diagnosed with asthma and given inhalers to help manage her symptoms. (10 Marks)

- 1. Define FEV1 (2 Marks)**
- 2. What ratio does the GP expect her FEV1/FVC to be? (1 Mark)**
- 3. Describe the first breath (4 Marks)**
- 4. What are three functions of surfactant (3 Marks)**

(Question 11)

Mrs Jones is a 71 year old lady who fell at home. She had an x-ray which showed a neck of femur fracture. She is referred for a DEXA scan, which results in her being diagnosed with osteoporosis. (10 Marks)

- 1. What cell type is responsible for bone resorption? (1 Mark)**
 - 2. Most tissues grow by interstitial growth. What growth type is exhibited during bone formation? (1 Mark)**
 - 3. An increase in serum calcium causes an increase in what hormone from the thyroid gland? What cells produce this hormone? (2 Marks)**
 - 4. Name 2 proteins that regulate phosphate in the body. (2 Marks)**
 - 5. What is the major mineral found in the bone? (1 Mark)**
 - 6. What type of cell senses microcracks at its location in the bone. What does it do following this? (3 Marks)**
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(Question 12)

A 5 year old girl attends the general practice with her Mother, complaining of itchy skin. There are dry, red patches on her hands, back of her knees and her face. The GP diagnoses her with eczema. (10 Marks)

- 1. Give 2 functions of the skin. (2 Marks)**
- 2. Thick skin is found on the palms of the hands and the soles of the feet. What makes it different from normal skin? (1 Mark)**
- 3. Melanin is a pigment responsible for skin colour. In what type of cell is it synthesised? (1 Mark)**
- 4. What is the name of the cell type found in the basal epidermis that detects light touch? (1 Mark)**
- 5. Name the 5 layers of the epidermis in order from outermost to innermost (5 Marks)**

END OF PAPER

