

POSTGRADUATE INSTITUTE OF MEDICINE
UNIVERSITY OF COLOMBO

SELECTION EXAMINATION FOR MD (EMERGENCY MEDICINE)
APRIL/MAY 2018

Date :- 30th May 2018

Time :- 9.00 a.m. – 12.00 noon

ESSAY PAPER

Answer **all six (06)** questions.

Answer each question in a separate book.

1. A 35-year-old man was brought to the Accident & Emergency Department following a fall from a tree. He complains of severe pain over upper part of the spine. There were no significant external wounds. He was conscious, haemodynamically stable but he could not move his right lower limb. Neurological examination revealed following positive findings:

- loss of pain and temperature sensations on the medial side of the right arm, left lower limb and left side of the trunk below the sternal angle
- loss of proprioception on the right lower limb
- clawing of fingers on right hand
- loss of active movement of right lower limb with increase muscle tone and exaggerated tendon reflexes.

A CT scan done on him showed a fracture of a vertebra with spinal cord compression.

1.1.

1.1.1. State the nature and the level of the spinal injury and explain the anatomical basis for above neurological signs. (40 marks)

1.1.2. How does pain sensation from the medial side of the right arm reach the pain sensory area of the brain?
Illustrate your answer with a diagram. (30 marks)

1.2. Describe briefly the boundaries and the content of the carotid triangle. (30marks)

Contd...../2-

2. A 58-year-old patient with a history of alcoholic cirrhosis was brought to the hospital due to an episode of vomiting blood. On examination he was drowsy and disoriented. Mild jaundice and ascites were also noted. Initial investigation findings revealed an elevated serum bilirubin, hypoglycaemia, low serum albumin and prolonged prothrombin time (PT/INR of 2.5). Vomiting of blood was diagnosed as due to oesophageal varices.

2.1.

2.1.1. Briefly explain how a patient with cirrhosis develops oesophageal variceal bleeding. (10 marks)

2.1.2. Explain the physiological basis for his examination findings. (30 marks)

2.1.3. Explain the physiological basis for his investigation findings. (30 marks)

2.2. A 28-year-old female patient was brought to the Accident & Emergency Department with the following features; palpitations, tremors and nervousness. She also complains of pain in the anterior aspect of the neck of few days duration. On examination she was found to have pulse rate of 124 beats per minute, blood pressure of 160/60 mmHg, ejection systolic murmur over aortic area. There was a mild swelling and tenderness in the thyroid gland and extremities were warm.

Explain the physiological basis for her examination findings. (30 marks)

3. A 30-year-old man was admitted to the Accident and Emergency Department following a Russell's viper bite. On admission, he had haematuria, reduced urine output and acute kidney injury was suspected.
- 3.1. Define the term 'acute kidney injury'. (10 marks)
- 3.2. Describe the pathogenetic mechanisms leading to acute kidney injury in this patient. (30 marks)
- 3.3. List the biochemical investigations you would do to assess his renal function with the expected findings, explaining the pathological basis for those findings. (40 marks)

After several cycles of haemodialysis, the renal function improved from the acute state, however continued to have impaired renal function in subsequent follow up visits.

- 3.4. Explain the reasons for the persistent impairment of renal function in this patient. (20 marks)
- 4.
- 4.1. Explain an exponential process and time constant using a graph. (20 marks)
- 4.2. An adult patient following an isolated severe head injury is being ventilated by a constant-flow ventilator. Plot a graph of volume against the time for inspiration and expiration. (20 marks)
- 4.3. At constant inflation pressure if the compliance of the lung is 0.5 L/kPa and the resistance 0.6 kPa /L, how long it will take approximately 95% of the tidal volume to expire? (20 marks)
- 4.4. Why it is important to appreciate the meaning of the term "time constant" when ventilating patients. (40 marks)

5. A 24-year-old farmer was brought to Accident & Emergency Department with severe respiratory distress. On examination he was found to have bradycardia, miosis and hypotension. Family members informed that he was found to have vomiting and sweating profusely. There was an empty bottle of insecticide nearby. A clinical diagnosis of organophosphate poisoning was made.
- 5.1. Name the drug which should be given immediately to this patient. (20 marks)
- 5.2. Explain the pharmacological basis of using the drug you mentioned in 5.1. in the treatment of organophosphate poisoning. (40 marks)
- 5.3. List five (05) adverse effects of the drug you mentioned in 5.1. (20 marks)
- 5.4. List four (04) other indications for the drug you mentioned in 5.1. (20 marks)
- 6.
- 6.1. Briefly explain the following terms:
- 6.1.1. Multiple casualty incidents
 - 6.1.2. Phonetic alphabet
 - 6.1.3. Warning format –METHANE
 - 6.1.4. Platinum 10 minutes
 - 6.1.5. Surge capability (20 marks)
- 6.2. An explosion has taken place in a large chemical factory during working hours.
Draw a basic layout plan for incident site for effective and efficient management of the incident.
Briefly explain the main purpose(s) of the components. (30 marks)
- 6.3. State ten (10) activities which should take place in the local hospital on receipt of the warning regarding the incident mentioned in 6.2. (30 marks)
- 6.4. Briefly outline the main mechanism(s) by which the following agents affect the human body.
- 6.4.1. Sarin
 - 6.4.2. Hydrogen cyanide
 - 6.4.3. Chlorine gas
 - 6.4.4. Mustards
- (20 marks)