First Year MBBS Examination

I MBBS Physiology Paper 1

Date: 24-11-2023

1123E352

Time: 3 hours

Max Marks: 100

Instructions: 1. Answer to the points. 2. Use separate answer books for each section. 3. Draw diagrams wherever necessary.

Section 1

1. **Write the following structured long question (any 1 out of 2) (10)**
   a. Define blodd pressure. What are its normal values and regulatory mechanisms? Explain with diagram short term regulation of blood pressure.
   b. Enumerate different types odf circulatory shocks. Give the condition in which hypovolemic shock developes. What are the symptoms, pathophysiologic reasons behind the symptoms and

compensatory mechanisms of hypovolemic shock?

2. **Write the following case - based scenario / applied short notes (any 2 out of 3) (12)**

   a. A 43-year-old female frequently developed multiple bruises and petechiae on her body. She also complained on menorrhagia. She once noticed that when she hurt her finger while cutting vegetables, the bleeding took much longer time to stop. Her blood picture showed: RBC: 4.5 millions/emm, WBC: 7000/cmm, Platelets: 30000/cemm. Based on the scenario, answer the following questions: a) What is the probable diagnosis? (1) b) Why did she have the mentioned symptoms? (2) c) What other tests should be done to confirm the diagnosis?(3)

   b. A 65-year-old diabetic female developed facial oedema, pallor, lethargy, oliguria over a period of few months. Her investigations revealed serum creatinine 7mg%, blood urea: 107 mg, RBC 3.6 million/cmm, Hemoglobin 8gm%Urine showed presence of protein in it. Tje doctor performed some more tests and

suggested hemodialysis. Base on the information, answer the following:
a)What is the probable diagnosis?(1), b)What is the physiollogical basis of oedema & pallor (3), c) What will the status of her calcium level and why? (2).

c. What are the different types of jaundice. What is the pathophysiology of each of them? (2+4)

3. **Write short notes (any 3 out of 4) (18)**
   a. Secondary active transport
   b. Nutritional anemias
   c. Positive feedback mechanism
   d. Plasma proteins

4. **Answer in only 2-3 sentence (any 5 out of 6) (10)**
   a. Why SA node is considered to be the pacemaker of heart
   b. Significance of biconcave shape of RBC
   c. Example of second messenger system
   d. ECG changes in myocardial infarction
   e. Classification of leucocytes
   f. Basis of resting membrane potential

Section 2

1. **Write the following structured long**

question (any 1 out of 2) (10)

a. A person X takes deep breaths at slow respiratory rate. (Tidal Volume650ml & Respiratory rate10/min). Another person Y takes shallow breaths at high respiratory rate (TV: 300ml & RR 20/min). Considering their dead space air as 160 ml, calculate their pulmonary ventilation and alveolar ventilation. Who, do you think is having better alveolar ventilation and why? Add a note on Cheyne Stoke respiration (2+2+4+2)

b. What are the different volumes and capacities of lung? What is FVC and FEV1. What is the significance of FEV1? Name the methods used to measure Residual Volume. (3+2+4+1)

2. **Write short notes (any 2 out of 3) (12)**

a. Ventilation- Perfusion Ratio

b. Transport of CO_2 in blood

c. Renin-angiotensin aldesterone mechanism.

3. **Write short notes (any 3 out of 4) (18)**

a. Countercurrent mechanism for concentration of urine.

b. Diuretics acting on the different parts of the nephron

c. Breaking bad news to the patient's

relative

d. Renal compensation in metabolic acidosis

4. **Answer in only 2-3 sentence (any 5 out of 6) (10)**

a. Which plasma protein is first to appear in urine in renal disease and why?

b. Why hemstocrit of venous blood is higher than the arterial blood?

c. Why do we feel hotter on humid days?

d. Why oxygen hemoglobin dissociation curve is sigmoid in shape?

e. What is oxygen debt?

f. Why divers breathe gase at high pressure?