

Date: 05-04-2022

0422 E309

## **First Year MBBS Examination**

### **I MBBS Physiology Paper 1**

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. Enumerate the properties of cardiac muscle? Discuss in detail the four basic properties of cardiac muscle.
  - b. Define blood pressure. Discuss the short-term regulation of arterial blood pressure.
2. Write the following case - based scenario / applied short notes (any 2 out of 3) (12)
  - a. A 28-year-old man is brought to the emergency wing of a hospital by his family members.  
They complained that they found him in the

basement of their home next to a furnace, where he was trying to stay warm on a cold winter day. He appeared to be confused, nauseated, short of breath and complained of a headache. He had no past h/(history of) major medical complaints. On examination, the patient was lethargic and confused but his lips appeared a bright pink. A urine drug screen was obtained and was negative. His serum carboxyhemoglobin level was elevated. The patient was diagnosed with carbon monoxide poisoning and was admitted to the hospital for further treatment. a) Define hypoxia and explain in short the different types of hypoxia? b) What is the mechanism by which carbon monoxide causes hypoxia? c) Discuss indications of oxygen therapy.

- b. A 4-year-old boy is brought to the pediatrician by his parents, who have noted excessive bleeding around the knees and elbows. The parents noted that the child bleeds very easily when the skin is scratched. Family history is significant for the presence of hemophilia in the mother's family. He is diagnosed with a case of hemophili Laboratory findings:-

Complete blood cell (CBC): Hemoglobin: 10.9 g/dL (normal: 14-14 g/dL), Hematocrit: 32% (normal: 40%-54%), Platelets: 200,000/mm<sup>3</sup> (normal: 11-15 sec), APTT (activated partial

- thromboplastin time): 42 sec (normal: 24-35 sec), Bleeding time: 6 min (Normal: 2-8 min), Factor VIII: C level: 5% (normal: 25%-100%).
- a) Describe in short, the different types of hemophilia? b) What are the causes of increased clotting time? c) Discuss in short, the functions of platelets.
- c. Explain in short micturition reflex. Add a note on cystometrogram?
3. Write short notes (any 3 out of 4) (18)
- Metabolism of hemoglobin.
  - Resting membrane potential.
  - Active transport.
  - Actions of immunoglobulins (Antibodies).
4. Answer in only 2-3 sentence (any 5 out of 6) (10)
- Enumerate the different types of heart sounds.
  - Functions of the cell membrane.
  - Cause of sickle-cell anemia
  - Define homeostasis.
  - What are different blood groups in ABO-blood grouping?
  - P-wave in ECG.

## Section 2

5. Write the following structured long question (any 1 out of 2) (10)
- Discuss the neural regulation of respiration.
  - ~~Explain in detail the mechanics of ventilation.~~

6. Write short notes (any 2 out of 3) (12)
  - a. Explain the mechanism of fever.
  - b. Obesity.
  - c. Cardiovascular adaptation to exercise.
7. Write short notes (any 3 out of 4) (18)
  - a. Countercurrent mechanism in kidneys.
  - b. Describe the role of a physician in the health care system.
  - c. Difference between cortical and juxta-glomerular nephrons.
  - d. Renin-angiotensin system.
8. Answer in only 2-3 sentence (any 5 out of 6) (10)
  - a. Define cyanosis.
  - b. Define oxygen debt.
  - c. What is caisson disease?
  - d. Define heat-stroke.
  - e. What do you mean by renal threshold?
  - f. Define renal clearance of a substance.