

Question Paper

Exam Date & Time: 08-Jan-2024 (10:00 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION
FIRST PROFESSIONAL YEAR MBBS DEGREE EXAMINATION - JANUARY 2024
SUBJECT: PHYSIOLOGY - PAPER - I
(CBME BATCH)

Marks: 80

Duration: 160 mins.

Answer all the questions.

- 1) A group of soldiers were engaged in the combat after a rapid ascent at an altitude of 13000 ft, one of the soldiers suddenly developed difficulty in breathing, and was unable to continue the combat and collapsed at the spot. The soldier was taken to safety and oxygen therapy was started immediately while monitoring the vitals, and the soldier was subsequently transferred to the lower altitude of 8000 ft, for further treatment.
- 1A) Name the measures which if taken, would have prevented the collapse of the soldier (1)
1B) Name and describe protective reflex mechanism comes into play in this scenario (3)
1C) Describe the chemical regulation of respiration (6)
- 2) An 18-year-old college student while riding his bike met with a road traffic accident, and sustained multiple injuries on chest and abdomen, he was rushed to the emergency department of a nearby hospital. On Physical examination he was conscious but in mild to moderate distress with a heart rate of 140 beats/ minute, thready pulse, blood pressure of 80/40 mmHg, respiratory rate of 18 cycles/minute and temperature of 99.8° F. His abdominal examination reveals, diffuse tenderness to palpation. The rest of the examination was normal.
- 2A) Name the most probable diagnosis and name the Intravenous fluid of choice in this case. (2)
2B) What is the cause attributable to this condition? (1)
2C) Define and classify shock. (1+2 = 3 marks)
2D) Describe the stages of shock. (4)
- 3) **Short Notes:**
- 3A) Illustrate the genesis of resting membrane potential (4)
3B) An abandoned child was brought to the pediatrician by a member of NGO, with swelling all over the body with no visible signs of physical assault. Explain the basis of swelling in this case. (4)
3C) A 30-year-old pregnant female was admitted in the hospital with 5.8 g% of hemoglobin for blood transfusion. Patient developed signs of fever and chills within fifteen minutes through the blood transfusion. (1+3 = 4 marks)
- i) What is the immediate step needed to counter these symptoms
ii) Describe the hazards of blood transfusion

- 3D) Compare and contrast active and passive immunity (4)
- 3E) Describe the different process that prevent clot in the intravascular compartment (4)
- 3F) Explain the plasticity in smooth muscle by elaborating on molecular basis of smooth muscle contraction (4)
- 3G) Draw a neat, labelled diagram of sarcomere of skeletal muscle and add a note on sarco tubular System (2+2 = 4 marks)
- 3H) Define refractory period. Describe its types. Explain the rationale that prevents development of tetany in cardiac muscle. (1+2+1 = 4 marks)
- 3I) Define stroke volume. Explain factors affecting stroke volume (1+3 = 4 marks)
- 3J) Describe the process of transcapillary exchange during capillary circulation (4)
- 3K) Draw a neat, labelled diagram of respiratory membrane and enumerate factors affecting diffusion across respiratory membrane (2+2 = 4 marks)
- 3L) Illustrate the process of renal tubular handling of sodium (4)
- 3M) Compare and contrast water diuresis and osmotic diuresis (4)
- 3N) Define renal clearance. Explain how glomerular filtration rate is measured (1+3 = 4 marks)
- 3O) Define micturition and explain the pressure and volume change in urinary bladder (1+3 = 4 marks)

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Question Paper

Exam Date & Time: 10-Jan-2024 (10:20 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION
FIRST PROFESSIONAL YEAR MBBS DEGREE EXAMINATION - JANUARY 2024
SUBJECT: PHYSIOLOGY - PAPER - II
(CBME BATCH)

Marks: 80

Duration: 160 mins.

Answer all the questions.

Essay questions:

- 1) Ten days after thyroid surgery, a patient returns to his physician complaining of increasing muscle cramps in the lower back, legs, feet, and hands. On examination, Chvostek's sign and Trousseau's sign are positive. Laboratory test findings reveal hypocalcemia.
 - 1A) Explain the regulation of secretion and functions of the hormone deficient in the above case. (7)
 - 1B) Explain the basis of signs and symptoms seen in the above patient (3)

- 2) A medical student who visited the OPD was suffering from anxiety due to the upcoming exams and did not sleep for the last three days. The Physician prescribed him a Benzodiazepine, which binds to GABA-A receptors.
 - 2A) Explain the generation of an action potential in the postsynaptic neuron. (3)
 - 2B) With the help of diagrams and examples, explain presynaptic inhibition and facilitation. (5)
 - 2C) How will the above drug modulate synaptic transmission in the nervous system? (2)

- 3) **Short Answers:**
 - 3A) A 63-year-old man complained of occasional tingling in his feet and toes. A thorough neurological examination reveals that he has reduced vibration sense and position sense in his right leg.

Name the sensory tract, which is affected in the above condition. Draw a labelled diagram for this tract. (4)
 - 3B) Draw labelled diagrams to explain (2+2 = 4 marks)
 - a) Descending analgesia system.
 - b) Gate control theory of pain
 - 3C) Describe the functions of the prefrontal cortex. Name ANY TWO features of prefrontal lobotomy. (3+1 = 4 marks)
 - 3D) Explain the role of the nervous system in causing thermoregulatory changes in the body when exposed to a cold climate. (4)
 - 3E) Explain the organization and function of the motor cortex. Add a note on motor homunculus. (3+1 = 4 marks)
 - 3F) Compare REM sleep and NREM sleep. (4)
 - 3G) Describe the physiological actions of cortisol. (4)

- 3H) A 57-year-old man complained of pain in the abdomen. He notes that his stools are pale in colour. Ultrasonic examination revealed a mass in the proximal portion of the common bile duct causing complete obstruction.
Explain the digestive and absorptive processes that will be affected in this patient. (4)
- 3I) Give the composition and functions of saliva. Give any two associated dysfunctions, to which a patient with xerostomia is susceptible. (3+1 = 4 marks)
- 3J) Explain the functions of the large intestine. (4)
- 3K) Explain the trichromatic theory of colour vision. Add a note on colour blindness (3+1 = 4 marks)
- 3L) An 18-year-old male complained of difficulty in hearing. On examination, he had a significant rightsided hearing deficit accompanying a middle ear infection. His Left ear was healthy.
What will be the possible result for Rinne's test and Weber's test in the above patient? Give the basis for your answer. (1+3 = 4 marks)
- 3M) Explain how different parts of the eye contribute to the refractive power of the eye. Write a note on reduced eye. (4)
- 3N) Explain the endocrine functions of the placenta. (4)
- 3O) Define menarche, amenorrhoea and menopause. Give the Physiological basis for menopause. (3+1 = 4 marks)

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