



All India Institute of Medical Sciences, Kalyani
First Professional MBBS Examination, September 2025

Time: 3 Hrs.

Physiology (Paper-II)

Marks: 100

INSTRUCTIONS:

- Answer all questions.
- Illustrate your answers with well labelled diagram wherever necessary.
- Answer each section in a separate answer book.

SECTION – B (40 MARKS)

(Renal physiology, Endocrinology, Reproductive physiology)

Long answer Question: -

1×10=10

1. A 71-year-old man experiencing chest pain and difficulty breathing waited 4 hours before finally calling for help. The man was diagnosed with an acute myocardial infarction and was hypotensive for several hours following the infarction. Over the next week, his urine output decreased and plasma creatinine increased. He underwent hemodialysis, and his urine output gradually returned to normal. (2+8)
 - a. Which substance is most likely responsible for the initial elevation in plasma creatinine and decrease in urine output?
 - b. Explain in detail the long-term regulation of blood pressure by kidneys.

Short Answer Questions: -

5×4=20

2. Explain why iodine deficiency causes both hypothyroidism and goitre.
3. Describe physiological changes during pregnancy.
4. Mechanism of action of Oral contraceptive pills for women
5. A 70-year-old type – II diabetes patient who had fever for two days was brought to the emergency in unconscious state. He was regular insulin treatment. On examination he was febrile with tachycardia and capillary blood glucose of 43mg/dl. (1+2+1)
 - a. What is the most probable cause for this condition?
 - b. How will you manage?
 - c. What advice will you give to prevent such episodes in future?
6. A newborn female is brought to the clinic due to the appearance of ambiguous external genitalia at birth. Further laboratory investigations indicate significantly low plasma cortisol and aldosterone levels. Concurrently, there is an elevated concentration of adrenal androgen precursors in the blood. (1+2+1)
 - a. What is the most probable diagnosis?
 - b. Explain the Pathophysiology
 - c. How will you manage the condition?

Very Short Answer Questions: -

5×2=10

7. A person with cortisol deficiency develops hypoglycemia and hypotension. Explain the physiological basis.
8. Write a brief note- Indicators of ovulation
9. Write a brief note- Lactational amenorrhoea
10. In chronic renal diseases severe osteoporosis occurs- Explain the physiological basis.
11. During parturition positive feedback plays role-Explain

SECTION – C (40 MARKS)
(Neurophysiology, Special senses, Exercise Physiology & Yoga)

Long answer Question: -

1×10=10

1. What are the components of Basal ganglia? Why there occurs bradykinesia in parkinsonism, discuss with suitable diagram. What is the therapeutic molecules for treating parkinsonism and what are the physiological basis of their use? (3+4+3)

Short Answer Questions: -

5×4=20

2. Explain brown Sequard syndrome
3. Explain the following in the context of synapse (2+2)
 - a. Subliminal fringe
 - b. Occlusion
4. Write a brief note - Muscle spindle
5. Write a brief note - Neural basis of memory
6. Write a brief note - Comparator function of cerebellum in motor learning

Very Short Answer Questions: -

5×2=10

7. Damage to Broca's area results in non-fluent aphasia, whereas damage to Wernicke's area causes fluent but meaningless speech. Explain the neural basis for these differences.
 8. Why does damage to the cerebellum result in ataxia and intention tremor? Explain neural mechanisms.
 9. What are the functions of Ear ossicles?
 10. Briefly describe Oxygen debt.
 11. Pilots spend some hours in red goggles before flight- Give physiological basis.
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