



**All India Institute of Medical Sciences, Kalyani**  
**B.Sc. MLT First Year Final Examination, August 2024**

**Time: 3 Hrs.**

**Physiology**

**Marks: 100**

**INSTRUCTIONS:**

- Answer all questions.
- Illustrate your answers with well labelled diagram wherever necessary.
- Answer Physiology Section A & B in separate answer booklets.

**SECTION – A (40 MARKS)**

**Short or Brief Answer Questions:**

**[8×5=40]**

1. Compare and contrast Positive and Negative feedback mechanisms of homeostasis. (5)
2. Explain the coagulation pathway using a flow chart and list the major anticoagulants used in laboratory practice. (3+2)
3. What are the factors affecting systolic and diastolic blood pressure? Describe the short-term mechanisms of regulation of arterial blood pressure. (2+3)
4. Describe briefly the mechanism of transport of CO<sub>2</sub> in blood. Add a note on Chloride shift. (3+2)
5. Define Contraception. Compare and contrast hormonal and barrier contraceptive methods with examples. (1+2+2)
6. Explain the conducting system of heart using suitable diagram. (5)
7. Outline the steps of spermatogenesis using a flowchart. (5)
8. Explain the mechanism of skeletal muscle contraction. (5)

**SECTION – B (40 MARKS)**

**Long Answer Questions:**

**[4×10=40]**

1. Define erythropoiesis. Explain the steps of erythropoiesis using a flow chart. Write briefly the factors affecting erythropoiesis. (1+5+4)
2. Draw a structure of neuro-muscular junction and explain the steps of neuromuscular transmission. (5+5)
3. Write the composition, function, and phases of secretion of gastric juice. Add a note on peptic ulcer. (2+3+3+2)
4. Draw a neat labelled diagram of visual pathway. Briefly describe the most common two errors of refraction and measures of their corrections, using suitable diagrams. (4+3+3)

  
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Enrollment No. \_\_\_\_\_

Invigilator sign: \_\_\_\_\_

**SECTION C (PHYSIOLOGY)**

**INSTRUCTIONS:**

- Section C (PHYSIOLOGY) should be answered in first 20 minutes of the Exam duration and handed over to the invigilators.
- Put one Tick (✓) mark to only one answer that you consider correct for each question.
- Mark your Tick (✓) in pen.

**Multiple Choice Questions (MCQs):**

**[20x1=20]**

1. Function of basal ganglia include
  - a. Gross motor
  - b. Skilled movements
  - c. Emotions
  - d. Coordination of movements
2. Cerebrospinal fluid does NOT pass through
  - a. Ventricles
  - b. Venous sinuses
  - c. Epidural spaces
  - d. Subarachnoid space
3. Which of the following is responsible for cell-mediated immunity?
  - a. B cells
  - b. T cells
  - c. Neutrophils
  - d. Basophils
4. The normal resting heart rate in adults is:
  - a. 60-100 beats per minute
  - b. 40-60 beats per minute
  - c. 100-120 beats per minute
  - d. 120-140 beats per minute
5. CO<sub>2</sub> is primarily transported in the arterial blood as
  - a. Dissolved CO<sub>2</sub>
  - b. Carbonic acid
  - c. Carbamino-hemoglobin
  - d. Bicarbonate
6. Spirometry can demonstrate and measure all of the following EXCEPT
  - a. Tidal volume
  - b. Residual volume
  - c. Vital capacity
  - d. Inspiratory reserve capacity
7. Mean arterial pressure is calculated as
  - a. (Systolic Blood pressure + Diastolic Blood Pressure)/2
  - b. Systolic Blood pressure + (Systolic Blood pressure - Diastolic Blood Pressure)/3
  - c. Diastolic Blood pressure + (Systolic Blood pressure - Diastolic Blood Pressure)/3
  - d. Diastolic Blood Pressure + Pulse Pressure/2
8. The normal pH range of blood is:
  - a. 6.8 - 7.2
  - b. 7.35 - 7.45
  - c. 7.5 - 8.0
  - d. 8.0 - 8.5
9. Which of the following is NOT a function of the liver?
  - a. Protein synthesis
  - b. Bile production
  - c. Insulin secretion
  - d. Detoxification
10. In the following food items, which one has the highest "Glycemic Index"?
  - a. Corn-flakes
  - b. Brown rice
  - c. Ice-cream
  - d. Whole-wheat bread
11. Which of the following is NOT a function of the hypothalamus?
  - a. Temperature regulation
  - b. Control of food intake
  - c. Secretion of ADH
  - d. Production of red blood cells

12. The hormone responsible for water reabsorption in the kidney is:

- a. Aldosterone
- b. Antidiuretic hormone (ADH)
- c. Atrial natriuretic peptide
- d. Parathyroid hormone

13. Melatonin is secreted by

- a. Hypothalamus
- b. Adrenal cortex
- c. Pineal gland
- d. Melanocytes

14. The hormone responsible for milk production is:

- a. Estrogen
- b. Progesterone
- c. Oxytocin
- d. Prolactin

15. Which of the following is NOT a function of the skin?

- a. Temperature regulation
- b. Vitamin D synthesis
- c. Oxygen exchange
- d. Protection against pathogens

16. The normal range for fasting blood glucose is:

- a. 70-100 mg/dL
- b. 100-140 mg/dL
- c. 140-200 mg/dL
- d. 200-300 mg/dL

17. The medium with highest refractive index in the eye is

- a. Cornea
- b. Aqueous humour
- c. Lens
- d. Vitreous Humour

18. One of the following is the function of Hypothalamus

- a. Swallowing
- b. Vomiting
- c. Respiration
- d. Thermoregulation

19. All are increased during exercise EXCEPT-

- a. Cardiac Output
- b. Total peripheral resistance
- c. Venous return
- d. Coronary blood flow

20. The main site of water absorption in the gastrointestinal tract is:

- a. Stomach
  - b. Small intestine
  - c. Large intestine
  - d. Rectum
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