



MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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UNIVERSITY EXAMINATIONS 2023/2024

FIRST YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR
OF SCIENCE IN NURSING

NND/NUU 3122: MEDICAL PHYSIOLOGY II

DATE: APRIL 2024

TIME: 3 HOURS

INSTRUCTIONS: *All questions are compulsory*

Ensure that all your answers are properly numbered

Part 1 Multiple Choice Questions (MCQs): Write the correct answer on the space provided in the answer booklet. Each MCQ is one mark.

Part 11: Short Answer Questions-Answer questions following each other on the answer booklet

Part 111: Long Answer Questions-Answer the questions on the answer booklet.

SECTION A: Multiple Choice Questions (20 MARKS)

1. A 55-year patient undergoes gastrectomy. The surgeon informs him that he needs Vitamin B12 injections for the rest of his life. This is because of absence of which type of cells:
 - a. Goblet cells
 - b. Chief cells
 - c. Parietal cells
 - d. G cell
2. Puberty is initiated by?



- a. FSH
 - b. GnRH
 - d. Testosterone
3. Endolymph can be located in the _____ of the ear?
- a. Scala tympani
 - b. Scala vestibuli
 - c. Scala media
 - d. Oval window
4. A patient with signs of osteoporosis and urolithiasis has been admitted to the endocrinology department. Blood test revealed hypercalcemia and hypophosphatemia. These changes are associated with abnormal synthesis of which of the following hormone?
- a. Parathyroid hormone
 - b. Calcitonin
 - c. Cortisol
 - d. Aldosterone
5. A 19-year old male was found to have an elevated level of potassium in the secondary urine. These changes might have been caused by the increase in the following hormone level:
- a. Aldosterone
 - b. Oxytocin
 - c. Adrenalin
 - d. Glucagon
6. Prior to glucose utilization in cells it is transported inside cells from extracellular space through plasmatic membrane. This process is stimulated by the following hormone:
- a. Aldosterone
 - b. Thyroxin
 - c. Adrenalin
 - d. Insulin
7. Which of the following is not essential for normal biosynthesis of thyroid hormones?
- a. Iodine
 - b. Ferritin
 - c. Thyroglobulin

- d. Protein synthesis
8. The enzyme primarily responsible for the conversion of T₄ to T₃ in the periphery is
- DI thyroid deiodinase.
 - D2 thyroid deiodinase.
 - D3 thyroid deiodinase.
 - thyroid peroxidase
9. Glucagon increases glycogenolysis in liver cells but ACTH does not because
- cortisol increases the plasma glucose level.
 - liver cells have an adenylyl cyclase different from that in adrenocortical cells.
 - ACTH cannot enter the nucleus of liver cells.
 - the membranes of liver cells contain receptors different from those in adrenocortical cells.
10. In the presence of vasopressin, the greatest fraction of filtered water is absorbed in the
- Proximal Tubule.
 - Loop of Henle.
 - Distal Tubule.
 - Cortical collecting duct
11. Glucose reabsorption occurs in the
- proximal tubule.
 - loop of Henle.
 - distal tubule.
 - cortical collecting duct
12. Which of the following has the highest pH?
- Gastric Juice
 - Hepatic Bile
 - Pancreatic Juice
 - Saliva
13. Which of the following would not be produced by total pancreatectomy?
- vitamin E deficiency
 - hyperglycemia



- c. metabolic acidosis
 - d. weight gain
14. A patient with a tumor secreting abnormal amounts of gastrin (gastrinoma) would be most likely to exhibit which of the following?
- a. decreased chief cell exocytosis
 - b. duodenal ulceration
 - c. increased gastric pH in the period between meals
 - d. a reduced incidence of gastroesophageal reflux disease
15. Inhibin is a hormone secreted by?
- a. Adrenal gland
 - b. Pancreas
 - c. Thymus
 - d. Gonads
16. Rotational acceleration of the head is sensed by?
- a. Semicircular canals
 - b. Utricles
 - c. Sacculi
 - d. Cochlea
17. Which of the following is a gland in the female reproductive system?
- a. Bulbourethral (Cowper's gland)
 - b. Prostate gland
 - c. Seminal vesicles
 - d. Bartholin's gland
18. Which cranial nerve serves the posterior 1/3 of the tongue?
- a. Glossopharyngeal
 - b. Vagus
 - c. Hypoglossal
 - d. Trigeminal
19. Parasympathetic stimulation causes which of the following?
- a. Ejaculation
 - b. Pupillary constriction
 - c. Increased heart rate
 - d. Increased respiration

20. The optic chiasma is?

- a. Where stereognosis occurs
- b. Where optic nerve decussation occurs
- c. A region of chemical synapses
- d. Very charismatic.

SECTION B: SHORT ANSWER QUESTIONS 40 MARKS

- 1. List any five hypothalamic hormones and state the role of each (5 marks)
- 2. State the functions of the renal system (5 marks)
- 3. Describe physiological mechanisms of hormonal release (5 marks)
- 4. Distinguish between Special and General Senses (5 marks)
- 5. Describe five causes of muscle fatigue (5 marks)
- 6. Name five cranial nerves and state their functions (5 marks)
- 7. a) State two hormones secreted by the adrenal medulla (2marks)
- b) Outline any three physiological effects of the above hormones (3marks)
- 8. a) List the hormones secreted by the male gonads (1 mark)
- b) State Four physiological roles of the above hormone (4marks)

SECTION C: LONG ANSWER QUESTIONS 40MARKS

- 1. With reference to the urinary system;
 - a) Explain the physiological mechanisms that regulate the Glomerular Filtration Rate (GFR) (10 Marks)
 - b) Describe urine concentration mechanisms before micturition (10 Marks)
- 2. With reference to the digestive system;
 - a) Explain the role of the Enteric Nervous System in the gastrointestinal tract (10Marks)
 - b) Describe the motilities of both upper and lower gastrointestinal tract (10marks)

