

CHUKA



UNIVERSITY

**UNIVERSITY EXAMINATION**

**RESIT/SUPPLEMENTARY / SPECIAL EXAMINATIONS**

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF  
SCIENCE (NURSING)**

**NURS 115: MEDICAL PHYSIOLOGY II**

**STREAMS: BSc. Nursing (Y1S2)**

**TIME: 2 HOURS**

**DAY/DATE: FRIDAY 17/09/2021**

**2 .30 P.M - 4.30 P.M.**

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**INSTRUCTIONS:**

1. Do not write anything on the question paper.
2. Mobile phones and any other reference materials are NOT allowed in the examination room.
3. The paper has three sections. Answer ALL questions in Sections I and II and ONE question in section III.
4. All your answers for Section I (MCQs) should be on one page.
5. Number ALL your answers and indicate the order of appearance in the space provided in the cover page of the examination answer booklet.
6. Write your answers legibly and use your time wisely

**Section A: Multiple Choice Questions (20 Marks)**

1. Secretion of HCl by parietal cells is needed for:
  - a) Activation of pancreatic lipases
  - b) Activation of pepsinogen to pepsin
  - c) Activation of salivary lipases
  - d) Activation of intrinsic factor
2. Which of the following would cause an increase in the glomerular filtration rate (GFR)?
  - a) Constriction of the afferent arteriole
  - b) Constriction of the efferent arteriole

- c) Increased plasma protein concentration
  - d) Constriction of the ureter
3. Which of the following is absorbed by facilitated diffusion?
- a) Fructose in duodenal cells
  - b) Glucose in duodenal cells
  - c) Dipeptides in duodenal cells
  - d) Bile acids in ileal cells
4. Estrogen is responsible for development of female secondary sex characteristics, including:
- a) Narrow shoulders
  - b) Broad hips and wider carrying angle
  - c) Divergent arms
  - d) Convergent thighs and wider pelvic inlet
5. Which of the following is an integration center for autonomic reflexes?
- a) Hypothalamus
  - b) Thalamus
  - c) Pons
  - d) Cerebrum
6. The sweat glands and piloerector muscles of hairy skin are innervated by which of the following fiber types?
- a) Cholinergic postganglionic parasympathetic fibers
  - b) Cholinergic postganglionic sympathetic fibers
  - c) Adrenergic preganglionic parasympathetic fibers
  - d) Adrenergic postganglionic sympathetic fibers
7. Which of the types of neurons communicates the information from the central to the peripheral nervous system?
- a) Sensory neuron
  - b) Interneuron
  - c) Motor neuron
  - d) Afferent neuron

8. When do progesterone levels rise to their highest point during the female hormonal cycle?
  - a) Between ovulation and the beginning of menstruation
  - b) Immediately before ovulation
  - c) When the blood concentration of luteinizing hormone is at its highest point
  - d) When 12 primary follicles are developing to the antral stage
9. Which of the following hormones is both synthesized and stored in the pituitary gland?
  - a) Growth hormone (GH)
  - b) GH releasing hormone (GHRH)
  - c) ADH
  - d) Somatostatin
10. The pro-enzyme pepsinogen is secreted mainly from which of the following structures?
  - a) Acinar cells of the pancreas
  - b) Ductal cells of the pancreas
  - c) Epithelial cells of the duodenum
  - d) Gastric glands of the stomach
11. Which type of cholinergic receptor is found at synapses between preganglionic and postganglionic neurons of the sympathetic system?
  - a) Muscarinic
  - b) Nicotinic
  - c) Alpha
  - d) Beta<sub>1</sub>
12. In controlling aldosterone secretion, angiotensin II acts on which of the following structures?
  - a) Zona glomerulosa
  - b) Zona fasciculata
  - c) Zona reticularis
  - d) Adrenal medulla
13. Which of the following best describes the process by which glucose can be formed from amino acids?
  - a) Gluconeogenesis

- b) Glycogenesis
  - c) Glycogenolysis
  - d) Glycolysis
14. Which of the following changes tends to increase GFR?
- a) Increased afferent arteriolar resistance
  - b) Decreased efferent arteriolar resistance
  - c) Increased glomerular capillary filtration coefficient
  - d) Increased Bowman's capsule hydrostatic pressure
15. Which of the following terms applies to the combination of a motor neuron and all the skeletal muscle fibers contacted by that motor neuron?
- a) Golgi tendon organ
  - b) Motor unit
  - c) Propriospinal neurons
  - d) Skeletal muscle fibers
16. Where does fertilization normally take place?
- a) Uterus
  - b) Cervix
  - c) Ovary
  - d) Ampulla of the fallopian tubes
17. Which of the following has similar values for both intracellular and interstitial body fluids?
- a) Potassium ion concentration
  - b) Colloid osmotic pressure
  - c) Sodium ion concentration
  - d) Total osmolarity
18. The two hemispheres of the brain are connected by which nerve fibers or pathways?
- a) Lateral lemniscus
  - b) Corticofugal fibers
  - c) Corpus callosum
  - d) Arcuate fasciculus

19. Cells of the adrenal medulla receive synaptic input from which of the following types of neurons?
- Preganglionic sympathetic neurons
  - Postganglionic sympathetic neurons
  - Preganglionic parasympathetic neurons
  - Postsynaptic parasympathetic neurons
20. Erythrocytes are constantly dying and being replaced. Heme from the hemoglobin is converted to which of the following substances before being eliminated from the body?
- Bilirubin
  - Cholesterol
  - Cholic acid
  - Globin

**Section B: Short Answer Questions (40 Marks)**

- Protein binding slows the rate of clearance of hormones from plasma. Explain this statement (6 marks)
- Explain any three (3) physiological effects of glucocorticoids (6 marks)
- Explain three (3) physiological mechanisms that stimulate hydrochloric acid secretion by the parietal cells in the stomach (6 marks)
- State four (4) physiologic functions of Sertoli cells (4 marks)
- Explain how angiotensin II contributes to the regulation of the rate of glomerular filtration (6 marks)
- Briefly describe the physiologic roles of the liver under the following subheadings:
  - Protein metabolism (3 marks)
  - Lipid metabolism (3 marks)
- Briefly describe the processes of reabsorption and secretion in the late distal convoluted tubules and the collecting ducts of the kidneys (6 marks)

**Section C: Long Answer Questions (40 Marks)**

- The nervous system is a communications and control network for the human body:
  - State the four (4) main regions of the human brain (4 marks)
  - Explain three homeostatic roles of the cerebrospinal fluid (6 marks)
  - State four (4) functions of the hypothalamus (4 marks)

- d) Describe any three (3) physiological effects that occur following sympathetic stimulation (6 marks)
  - 2. Discuss the hormonal regulation of the female reproductive cycle (20 marks)
  - 3. The endocrine system broadcasts its hormonal messages to essentially all body cells by secretion into blood and ECF:
    - a) Describe any four (4) physiological effects of thyroid hormones (8 marks)
    - b) Explain the physiological mechanisms that control thyroid hormone secretion (6 marks)
    - c) Describe three (3) physiological effects of parathyroid hormone (6 marks)
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