



AMREF INTERNATIONAL UNIVERSITY

SCHOOL OF MEDICAL SCIENCES

DEPARTMENT OF REHABILITATIVE MEDICINE

BACHELOR OF SCIENCE IN PHYSIOTHERAPY

END OF SEPTEMBER-DECEMBER TRIMESTER 2022 EXAMINATIONS

PHT 127: HUMAN PHYSIOLOGY II

DATE: 30TH NOVEMBER 2022

TIME: 2 Hours Start: 9:00am Finish: 11:00am

INSTRUCTIONS

1. All students will have two (2) hours to complete the examination
2. Attempt all questions as per the instruction
3. It is the student's responsibility to report any page and number missing in this paper.
4. Check that the paper is complete
5. Total number of pages is 9 including the cover.
6. Read through the paper quickly before you start.
7. Upon finishing the exam paper, make sure you have written your student number before you submit.
8. Do Not write anything on the question paper -use the back of your booklet for rough work if need be

Multiple choice question (40marks)

1. The term “brain of the gut” is used to refer to the:
 - a. autonomic ganglia
 - b. enteric nervous system
 - c. migratory motor complex
 - d. interstitial cells of Cajal
 - e. Low resistant gap junctions
2. The release of gastrin from G cells in the antrum of the stomach is inhibited by:
 - a. activation of vagal efferent fibers to the stomach
 - b. circulating epinephrine
 - c. blood-borne calcium
 - d. mechanical distention of the stomach
 - e. somatostatin
3. Gastric emptying is slowest after a meal containing:
 - a. fat
 - b. carbohydrate
 - c. protein
 - d. indigestible fiber
 - e. Isotonic solution
4. Bile acids are synthesized starting from:
 - a. cholesterol
 - b. fatty acids
 - c. lecithin
 - d. bile salts
 - e. Glycine
5. Trypsinogen, a pancreatic proenzyme, is activated by:
 - a. enterokinase
 - b. hydrochloric acid
 - c. HCO_3^-
 - d. pancreatic trypsin inhibitor
 - e. pepsinogen
6. Most pancreatic zymogens are activated in the duodenal lumen by:
 - a. enterokinase (enteropeptidase)
 - b. trypsin
 - c. trypsin activator protein
 - d. CCK
 - e. Pepsinogen
7. The major humoral mediator of gall bladder contraction in response to a fat meal is:
 - a. CCK
 - b. gastrin
 - c. secretin
 - d. somatostatin
 - e. Acetylcholine

8. The most potent stimulus for release of secretin from the duodenum is:
- reduction in duodenal lumen pH to < 4.5
 - peptides
 - fatty acids with > 8 carbons
 - carbohydrates
 - Bile salts
9. Which of the following statements about CCK is incorrect?
- It causes gall bladder contraction.
 - It relaxes the sphincter of Oddi.
 - It relaxes the pyloric sphincter.
 - It stimulates the secretion of an enzyme-rich pancreatic juice.
 - Stimulates the vagus to release Nitric Oxide at the sphincter of Oddi
10. In healthy humans, active absorption of bile acids and bile salts occurs mainly in the:
- duodenum
 - jejunum
 - terminal ileum
 - colon
11. True about Pancreatic secretion
- In response to vagal stimulation is copious, rich in bicarbonate but poor in enzymes.
 - In response to acid in the duodenum is scanty but rich in enzymes.
 - In response to secretin secretion is low in bicarbonate.
 - Contains enzymes that digest neutral fat to glycerol and fatty acids.
 - Contains enzymes that convert disaccharides to monosaccharides.
12. An increase in the concentration of plasma potassium causes increase in:
- release of renin
 - secretion of aldosterone
 - secretion of ADH
 - release of natriuretic hormone
 - production of angiotensin II .
13. Amino acids are almost completely reabsorbed from the glomerular filtrate via active transport in the :
- proximal tubule
 - loop of Henle
 - distal tubule
 - collecting duct
 - renal pelvis

14. Glomerular filtration rate would be increased by :
- constriction of the afferent arteriole
 - a decrease in afferent arteriolar pressure
 - compression of the renal capsule
 - a decrease in the concentration of plasma protein
 - a decrease in renal blood flow
15. The greatest amount of hydrogen ion secreted by the proximal tubule is associated with :
- excretion of potassium ion
 - excretion of hydrogen ion
 - reabsorption of calcium ion
 - reabsorption of bicarbonate ion
 - reabsorption of phosphate ion
16. Most of the glucose that is filtered through the glomerulus undergoes reabsorption in the :
- proximal tubule
 - descending limb of the loop of Henle
 - ascending limb of the loop of Henle
 - distal tubule
 - collecting duct
17. In the presence of ADH, The distal nephron is least permeable to :
- water .
 - ammonia .
 - urea .
 - sodium .
 - carbon dioxide.

18. The effect of antidiuretic hormone (ADH) on the kidney is to :
- increase the permeability of the distal nephron to water.
 - increase the excretion of Na^+
 - increase the excretion of water
 - increase the diameter of the renal artery .
19. In the distal tubules, sodium reabsorption is increased directly by increased :
- sympathetic nerve stimulation of the kidney .
 - atrial natriuretic hormone secretion .
 - antidiuretic hormone secretion .
 - aldosterone secretion
 - angiotensin secretion .
20. Select the correct answer about proximal tubules :
- K^+ is secreted in exchange with the Na^+ which is reabsorbed under the effect of aldosterone
 - glucose , amino acids & proteins are completely reabsorbed
 - only 10% of the filtered water is reabsorbed
 - parathormone increase phosphate reabsorption .
21. About the proximal convoluted tubules , all are true except :
- reabsorb most of Na^+ ions in glomerular filtrate
 - reabsorb most of Cl^- ions in glomerular filtrate
 - reabsorb most of K^+ ions in glomerular filtrate
 - contains JGCs which secrete renin
22. Which of the following lung volumes or capacities can be measured by spirometry?
- Functional residual capacity
 - Physiologic dead space
 - Residual volume
 - Vital capacity
 - Alveolar partial pressures

23. An infant born prematurely in gestation week of 25 has neonatal respiratory distress syndrome. which of the following would be expected in this infant?
- a. Arterial partial pressure of 100%
 - b. Increased lung compliance
 - c. Collapse of the small alveoli
 - d. Normal respiratory rate
 - e. A right to left shunt
24. Which of the following is true during inspiration?
- a. Intrapleural pressure is a positive
 - b. Intrapleural pressure is negative compared to expiration intrapleural pressure
 - c. Alveolar pressure is equal to atmospheric pressure
 - d. There is no pressure difference created between the atmosphere and the alveolar
 - e. Transmural pressure becomes positive
25. When a person is standing blood flow to the lungs
- a. At the apex is equal to the base
 - b. More blood flows to the lungs compared to the brain
 - c. Blood flow is highest to the apex
 - d. Blood flow is highest at the base
 - e. blood flow to the lungs reduces due to pulmonary vasoconstriction
26. The following is true about effects of hypoxia in the body
- a. It causes a systemic vascular resistance
 - b. It causes increased pulmonary vascular resistance
 - c. Causes pulmonary hypotension
 - d. Causes systemic hypertension
 - e. carbon dioxide causes cerebral vasodilatation

27. About tidal volume

- a. Its approximately 2300 in a normal individual
- b. It increases in sympathetic stimulation
- c. It increases in parasympathetic stimulation
- d. It's the amount of air that remains in the lungs after forceful expiration
- e. is not affected by gender

28. During breathing in

- a. The lung volume decreases
- b. Alveolar pressure is higher than the atmospheric pressure
- c. There is an inverse proportionality between alveolar pressure and alveolar volume
- d. Relationship between the alveolar volume and pressure is directly proportional
- e. Venous return decreases.

29. Which of the following hormones is not secreted by the adenohypophysis?

- a. ADH
- b. ACTH
- c. TSH
- d. FSH

30. All of the following are stimuli for growth hormone release except :

- a. Hypoglycemia
- b. Stress
- c. Obesity
- d. Exercise

31. C-cells are present in :

- a. Thyroid gland
- b. Adrenal cortex
- c. Parathyroid gland
- d. Pituitary gland

32. Which of the following is not an action of thyroid hormone :

- a. Raises BMR
- b. Increases cardiac output
- c. Decreases cholesterol
- d. Loss of libido

33. A patient with hypothyroidism is likely to have :
- Diarrhoea
 - Weight gain
 - Exophthalmos
 - Wet skin
34. Renal calculi is seen in :
- Hyperthyroidism
 - Hyperparathyroidism
 - Cushing's disease
 - Addison's disease
35. All are seen in Cushing's syndrome except :
- Truncal obesity
 - Hypertension
 - Hypoglycemia
 - Hirsutism
36. In addison's disease, the following is seen :
- Hyperkalemia
 - Increase in ecf volume
 - Hyperglycemia
 - High blood pressure
37. Full development and function of the seminiferous tubules require
- Androgens and FSH.
 - Oxytocin.
 - FSH
 - LH
38. In human males, testosterone is produced mainly by the
- Leydig cells.
 - Sertoli cells.
 - Seminiferous tubules.
 - Epididymis.
39. In case of low blood glucose concentration, negative feedback is
- To avoid sweets
 - To workout
 - To rest
 - Conversion of glycogen to glucose

40. Which one of the following is an example of a homeostatically controlled variable

- a. Heart rate
- b. Body temperature
- c. Hypothalamus
- d. Thermoreceptors

Short answer questions (10marks)

1. Outline the functions of the kidney (5marks)
2. Outline the characteristics of glomerular filtration barrier (5 marks)

Long answer question (10 marks)

1. Discuss gas exchange and transport in the body

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