(University of Choice)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUS

UNIVERSITY EXAMINATIONS
2017/2018 ACADEMIC YEAR

FIRST YEAR, SECOND TRIMESTER EXAMINATION

FOR THE DEGREE
OF
BACHELOR OF SCIENCE IN HEALTH PROFFESIONS EDUCATION

MAIN PAPER

COURSE CODE: NUR 110

COURSE TITLE: MEDCIAL PHYSIOLOGY

DATE: **TIME:**

INSTRUCTIONS TO CANDIDATES
Answer All Questions

Section A: Multiple Choice Questions (MCQ)	20 Marks.
Section B: Short Answer Questions (SAQ)	40 Marks.
Section C: Long Answer Question (LAQ)	40 Marks

TIME: 3 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 4 Printed Pages. Please Turn Over.

Moderated 8/7/2018

Section A: Multiple Choice Questions (MCQ's) **20 Marks**

1. An organism that lacks integration centres
    a. Cannot receive stimuli
    b. Will not have a nervous system
    c. Will not be able to interpret stimuli
    d. Lack myelinated neurons
2. Which of the following neuropeptides acts as a natural analgesic?
    a. Acetylcholine
    b. Epinephrine
    c. Endorphins
    d. Serotonin
3. The divisions of the nervous system that have antagonistic actions are
    a. Motor and sensory
    b. Sympathetic and parasympathetic
    c. Presynaptic and postsynaptic
    d. Forebrain and hindbrain
4. Which of the following is associated with the parasympathetic system?
    a. Rest and digestion
    b. Increased metabolic rate
    c. Fight and flight
    d. Release of epinephrine
5. During inspiration
    a. The diaphragm expands and the rib cage contracts
    b. The diaphragm contracts and the rib cage contracts
    c. The diaphragm moves and the rib cage constricts
    d. The diaphragm does not move and the rib cage expands
6. Oxygenated blood is carried to the lungs by
    a. Pulmonary artery
    b. Pulmonary vein
    c. Coronary artery
    d. Pre-cavals
7. If the thoracic wall but not lungs is punctured
    a. The lungs get inflated
    b. The man dies because the lungs collapse
    c. The breathing rate decrease
    d. The breathing rate increase
8. Respiratory mechanisms are controlled by
    a. Central nervous system
    b. Sympathetic nervous system
    c. Parasympathetic nervous system
    d. Autonomic nervous system
9. The amount of air that moves in and out of the lungs with each normal inspiration and expiration is called

a. Residual volume
b. Vital capacity
c. Tidal volume
d. Tidal capacity

10. The impulse for voluntary muscles for forced breathing starts in
    a. Medulla(pons)
    b. Vagus nerve
    c. Cerebral hemispheres
    d. Spinal cord
11. An increase in the concentration of plama potassium causes an increase in
    a. Release of rennin
    b. Secretion of aldosterone
    c. Secretion of ADH
    d. Release of natriuretic hormone
12. Amino acids are almost completely reabsorbed from the glomerular filtrate via active transport in the
    a. Proximal tubule
    b. Loop of henle
    c. Distal tubule
    d. Collecting tubule
13. Glomerular filtration rate(GFR) would be increased by
    a. Constriction of afferent arteriole
    b. Decrease in afferent arteriolar pressure
    c. Compression of the renal capsule
    d. A decrease in the concentration of plasma protein
14. Most of the glucose that is filtered through the glomerulus undergoes reabsorbsion in the
    a. Proximal tubule
    b. Loop of henle
    c. Distal convoluted tubule
    d. Collecting duct
15. The hydrostatic pressure in renal glomerular capillaries
    a. Is lower than pressure in efferent arterioles
    b. Rises when afferent arterioles constrict
    c. Is higher than in most capillaries at heart level
    d. Falls along the length of the capillary
16. The renal clearance of a substance
    a. Is inversely related to its urinary concentration
    b. Is directly related to the rate of urine formation
    c. Is directly related to its plasma concentration
    d. Must fall in the presence of metabolic poisons
17. In the nephron, the osmolality of fluid in the
    a. Tip of the loop of Henle is than that of plasma
    b. Bowman's capsule is less than that in the distal tubules
    c. Collecting duct rises when vasopressin is being secreted

d. Proximal convoluted tubule rises along its length

18. Regarding the control of speech
    a. In the left-handed people the faculty of speech is mainly located in the right hemisphere
    b. Individuals affected by Broca's aphasia are able to speak only with great difficulty
    c. An individual with Broca's aphasia will have paralysis of the lips and tongue
    d. Wernicke's aphasia results from damage to the frontal speech area
19. Which of the following is not a normal occurrence with increasing age?
    a. Vital capacity of the lung decreases
    b. Residual volume increases
    c. Functional residual capacity increases
    d. Expiratory reserve volume increases
20. Vagal stimulation causes slowing of the heart rate. This is due to increased permeability of the sinoatrial nodal fiber membrane to
    a. Calcium
    b. Chloride
    c. Sodium
    d. Potassium

Section B: Short Answer Questions (SAQ's) **20 Marks**

1. Explain three principal functions of the endocrine system (6marks)
2. Explain the negative mechanism feedback of cortisol (5marks)
3. Outline the mechanism of respiration (6marks)
4. State three(3) functions of the paranasal sinuses (3marks)
5. Explain the neural regulation of respiration (5marks)
6. Explain the rennin-angiotensin aldosterone system (6marks)
7. Outline three(3) basic renal processes (3marks)
8. Explain the regulation of the heart rate (6marks)

Section C. Long Answer Questions (LAQ's) **40 Marks**

1. Describe the following forms of blood circulation 20 marks
    a. Portal circulation
    b. Pulmonary circulation
    c. Foetal circulation
2. Describe the hypothalamic- pituitary control of hormones (20marks)

NUR 105: Human Physiology I (3 Units)

Learning outcomes

i. Describe the digestive system.
ii. Describe the Endocrine system and its function
iii. Describe the special senses
iv. Describe function of the skin and body temperature regulation.
v. Describe functions of the cardiovascular system.

Course Content

Digestive system: Functional organization and design. General principles of gastrointestinal; Transport and mixing of food in the tract. Secretory functions of the alimentary tract. Digestion and absorption in the gastrointestinal tract. Metabolism of carbohydrates and formation of adenosine triphosphate. Lipid metabolism. Protein metabolism; Transport of nutrients in blood and storage in tissues; Functions of the liver, biliary system and pancreas.
The Endocrine system: introduction to endocrinology, the pituitary hormones and their control by the hypothalamus, the thyroid metabolic hormones, the adrenocortical hormones, insulin, glucagons and diabetes mellitus, parathyroid hormone, calcitonin, calcium and phosphate metabolism, vitamin D, bone and teeth, reproductive and hormonal functions of the male (and the pineal gland) , female physiology before pregnancy and the female hormones, pregnancy and lactation, foetal and neonatal physiology, liver, kidneys, alimentary canal. Hormone: chemical nature, secretion, transportation in blood, receptors, mode of action, physiological effects, inactivation, degradation and excretion. Integrated actions of hormones: regulation of blood glucose, calcium homeostasis, body water, urea and electrolyte balance. Reproductive system:
The male and female reproductive system; The special senses: eye: optics vision, the eye; receptor and neural function of the retina, the eye; central neurophysiology of vision, the sense of hearing, the chemical senses – taste and smell; Control of visceral functions: the hypothalamic nuclei, functions and connections; Integration of autonomic reflexes, vital centres and vegetative functions; Body temperature regulation and skin function; Heart muscle, the heart as a pump, and functions of the arterial and venous systems.

Teaching –learning strategies

Lectures, demonstrations, skills laboratory teaching, practical, group discussions, self-directed, demonstrations

Assessment

The use of formative and summative assessments will be applied

- 3 Continuous Assessment tests , practical work reports, Term papers and small group presentations
- End of trimester examination using MCQ, short essay questions, long essay questions

Reading Resources

1. Netter, F. (2006). *Atlas of Human Anatomy.* Saunders. ISBN 1416033858.

2. Marieb E.N. & Mitchell S.J. (2007). *Human Anatomy and Physiology Lab. Manual.* (9th Ed.) Benjamin Cummings. ISBN: 0805372636.- Gahong & Gayton