(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS 2021/2022

ACADEMIC YEAR

FIRST YEAR SECOND TRIMESTER

MAIN EXAMINATION

FOR BACHELOR OF SCIENCE IN NURSING DEGREE

COURSE CODE: NUR 122

COURSE TITLE: MEDICAL PHYSIOLOGY II

DATE: 28/03/23 **TIME: 9am-12pm**

INSTRUCTIONS TO CANDIDATES

Answer ALL Section one (1) MULTIPLE CHOICE QUESTIONS and ALL Section two (2) SHORT ANSWER QUESTIONS and any one (1) section THREE (3) LONG ANSWER QUESTION.

TIME: 3 Hours

This paper consists of 8 printed pages. Please Turn Over

KIBU observes ZERO tolerance to examination cheating

PART ONE: MULTIPLE CHOICE QUESTIONS (ANSWER ALL)

1. The name given to the iron-containing protein that gives red blood cells their colour is:
   A. Hemocyanin
   B. Pyrite
   C. Hemoglobin
   D. Myoglobin
2. The area concerned with maintaining proper position of the body in space and subconscious coordination of motor activity is:
   a) The vermin.
   b) Internal capsule.
   c) Cereberum.
   d) Cerebellum.
3. The gall bladder does not:-:-
   A. Produce bile
   B. Concentrate bile
   C. Store bile
   D. All of the above
4. Most hormones of the endocrine system are regulated by a:
   A. Negative feedback mechanism.
   B. Positive feedback mechanism.
   C. Hormone-receptor complex.
   D. Hormone-gene complex.
5. Plasma without clotting factors is called
   A. Albumin
   B. Globulin
   C. Fibrinogen
   D. Serum
6. The part of the brain that contains the ascending and descending tracts that communicate between the spinal cord and parts of the brain is:
   a) Medulla oblongata.
   b) The pons.
   c) Midbrain.
   d) The pyramids.
7. A part of the brain that control the rate of and depth of breathing is located in:
   a) Cerebellum.
   b) The pons.
   c) Nuclei of midbrain.
   d) Pyramids.
8. Which of the following is true during inspiration?
   a) Intrapleural pressure is positive
   b) The volume in the lungs is less than the functional residual capacity (FRC)
   c) Alveolar pressure is higher than atmospheric pressure
   d) Intrapleural pressure is more negative than it is during expiration
9. Which volume remains in the lungs after a tidal volume (V_T) is expired?

a) Tidal volume (V_T)
b) Vital capacity (VC)
c) Residual volume (RV)
d) Functional residual capacity (FRC)

10. Which of the following is the site of highest airway resistance?
    a) Trachea
    b) Largest bronchi
    c) Medium-sized bronchi
    d) Smallest bronchi
11. Compared with the systemic circulation, the pulmonary circulation has a
    a) higher blood flow
    b) lower resistance
    c) higher arterial pressure
    d) higher capillary pressure
12. Compared with the apex of the lung, the base of the lung has
    a) a higher pulmonary capillary PO_2
    b) a higher pulmonary capillary PCO_2
    c) a higher ventilation/perfusion (V/Q) ratio
    d) the same V/Q ratio
13. Hypoxemia produces hyperventilation by a direct effect on the
    a) Phrenic nerve
    b) Lung stretch receptors
    c) Medullary chemoreceptors
    d) Carotid and aortic body chemoreceptors
14. Part of the brain which controls many homeostatic functions important in maintaining stability of internal environment is:
    a) Thalamus.
    b) Cerebellum.
    c) Hypothalamus.
    d) Reticular formation.

15. The specific area concerned with maintaining proper position of the body in space and subconscious coordination of motor activity is:
    a) Cerebrum.
    b) Motor area.
    c) Pre-frontal area.
    d) Cerebellum.
16. All twelve cranial nerves pass through the foramina of the skull to innervate structures in the head, neck,, and facial region, except;
    a) Vestibulocochlear nerve.
    b) Trigeminal nerve.
    c) Optic nerve.
    d) Vagal nerve.
17. This pressure facilitates filtration while urine is being formed

A. filtrate hydrostatic pressure
B. osmotic blood pressure
C. capillary hydrostatic pressure
D. all of these

18. The Glucagon hormone is:
    A. accelerates the conversion of glycogen into glucose.
    B. slows down glucose formation from lactic acid.
    C. decreases the conversion of glycogen into glucose.
    D. speeds up protein synthesis within cells.
19. Most hormones of the endocrine system are regulated by a:
    A. Negative feedback mechanism.
    B. Positive feedback mechanism.
    C. Hormone-receptor complex.
    D. Hormone-gene complex.
20. The ventricle that is located in the brainstem and is continuous with the central canal of the spinal cord is:
    a) First ventricle.
    b) Second ventricle.
    c) Third ventricle.
    d) Fourth ventricle.
21. The nerve that relay impulse related to swallowing, salivation and taste is:
    a) Vagus nerve (X).
    b) Glossopharyngeal (IX).
    c) Accessory (XI).
    d) Hypoglossal (XII).
22. The maintenance of the homeostasis, regulation of Body temperature; Heart rate and BP; Mineral and water balance; Appetite and digestive processes; Sleep and wakefulness; Emotions of fear, rage and the Secretion of hormones by the pituitary gland is accomplished by:
    a) Midbrain.
    b) Hypothalamus.
    c) Reticular formation
    d) Cerebrum.
23. Very small particles are removed from the respiratory system by
    a) Diffusion
    b) Expectoration
    c) Phagocytosis
    d) Ciliary transport
24. Part of the brain that control brainstem reflexes, Cardiovascular control, respiratory control is:
    a) Hypothalamus.
    b) Cerebral cortex.
    c) The pons.
    d) Medulla.

25. A structure which receives afferent sensory axons from different sources especially from the sensory nerves of the face and connects fibres to the centres in the cerebellum, hypothalamus and cerebrum is:
    a) Reticular formation.
    b) Wennicker's area.
    c) Brocas' area.
    d) Pons varolli.
26. Concerning the airways of the human lung:
    a) The volume of the rest of the lung during resting conditions is about 5 liters.
    b) A respiratory bronchiole can be distinguished from a terminal bronchiole because the latter has alveoli in its walls.
    c) On the average, there are about three branchings of the conducting airways before the frst alveoli appear in their walls.
    d) In the alveolar ducts, the predominant mode of gas flow is diffusion rather than convection.
27. The structure involved with sleep- wake cycle and learning- memory is:
    a) Hypothalamus.
    b) Reticular activating system.
    c) Thalamus.
    d) Midbrain.
28. The bridge connecting the spinal cord and the brain is formed by:
    a) Midbrain.
    b) The Vermis.
    c) The Pons.
    d) Reticular formation.
29. The PH range of blood is
    A. 7.35-7.45
    B. B. 2.25-3.45
    C. C. 7.45-8.45
    D. D. 4.5-7.5
30. This about second heart sound is incorrect
    A. it is occasionally split
    B. it is due to the closure of semilunar valves
    C. indicates the commencement of diastole
    D. it has a longer duration than the first sound
31. The reason for the dicrotic notch on the aortic pressure curve is
    A. contraction of aorta
    B. closure of the aortic valve
    C. rapid filling of the left ventricle
    D. closure of the pulmonary valve
32. Which of these is true of the endocrine system?
    A. secretes hormones that are transported to target cells by blood
    B. causes changes in metabolic activities
    C. effects are prolonged
    D. All of above are true.

33. The rise in the carotid sinus pressure leads to
    A. reflex hypercapnia
    A. reflex hyperpnea
    B. reflex bradycardia
    C. reflex tachycardia
34. All of the following are hormones of the anterior pituitary except:
    A. Human growth hormone (GH).
    B. Follicle-stimulating hormone (FSH).
    C. Parathyroid hormone(PTH)
    D. Thyroid-stimulating hormone (TSH).
35. The secretions from which of these glands differs between males and females?
    A. Adrenal.
    B. Parathyroid.
    C. Gonadal.
    D. Pancreas.
36. The absorption of fructose by intestinal mucosa is
    A. co-transport mechanism
    B. simple diffusion
    C. facilitated transport
    D. active transport
37. This artery passes blood to the kidney
    A. common iliac
    B. cystic
    C. renal
    D. coeliac
38. the functional unit of the kidney is;
    A. Hilum
    B. Neuron
    C. Nephron
    D. Medulla
39. On the heart, the impact of adrenaline is all of these except
    A. it increases the uptake of oxygen by the heart
    B. it increases the contraction force
    C. it decreases the myocardial irritability
    D. it increases the heart rate
40. The process of blood cell formation takes place in the in the bone marrow, this process is called
    A. Homeostasis
    B. Haemopoiesis
    C. Hematocritic
    D. Erythropoietin
41. The cell in the alveolus that secretes surfactant is called a
    A. Alveolar Macrophages
    B. Type I cell
    C. Type II cell

D. Pluripotent cell

42. Activity in the reflex arc starts in a sensory receptor with a receptor potential whose magnitude is proportionate to:
    a) The strength of the stimulus.
    b) The forces exerted.
    c) Number of receptors.
    d) Stimulus potential.
43. Autonomic sensory impulses carried to the autonomic reflex centers in the hypothalamus, brain stem or the spinal cord causes:
    a) Contraction of muscles and joints to take place.
    b) Facilitate information to be received and interpreted.
    c) Enhance motor impulses to be carried to the effector organ.
    d) Autonomic motor impulses to be carried to the effectors through cranial and spinal nerves.
44. Gastric secretions
    A. Increase in response to chewing of food in the mouth after vagus nerves to the stomach have been cut
    B. Are prevented from digesting gastric mucosal by pepsin activator
    C. Contain a substance which aids absorption of vitamin B_{12}
    D. Decrease when a hungry person anticipates a meal
45. Saliva
    A. Contains a starch –digesting enzyme
    B. Can break starch down to monosaccharide
    C. Has no important antiseptic action
    D. Is not necessary for normal swallowing
46. In the small intestines
    A. The concentration of digestive enzymes in the lumen is lower in the ileum than in the jejunum
    B. Vitamin $B_{12}$is absorbed mainly in the jejunum
    C. Water absorption is independent of absorption of sodium and glucose
    D. Glucose absorption is dependent of sodium absorption
47. Peristalsis in the lower esophagus is
    A. Increased in pregnancy
    B. Increased by gastric acid
    C. A major factor in preventing heartburn
    D. Is higher than in the middle esophagus
48. The area that receives impulses from sensory receptors of sensory nerves and interprets them as sensations is:
    a) Somato-sensory.
    b) Pre-frontal area.
    c) Primary-sensory cortex.

d) Motor cortex.

49. Internal respiration;
    a) Does not involve the external intercostal muscles
    b) Includes the utilization of the abdominal muscles
    c) Includes the utilization of sternocleidomastoids
    d) Includes the utilization of the diaphragm
50. In Pulmonary circulation
    a) The diastolic pressure is equal to that of the systemic circulation
    b) Blood flow is greater at the apex of the lung that the base
    c) Pulmonary arterioles are dilated by increased PO_2
    d) The amount of blood pumped into pulmonary artery is about 20% that pumped into the aorta.

SECTION TWO SHORT ANSWER QUESTIONS (SAQ) (ANSWER ALL QUESTIONS)

1. Compare and contrast the systemic and pulmonary circulatory systems. 10 marks.
2. Describe the composition and functions of saliva (5 Marks)
3. Describe the physiological mechanism of hearing (5 Marks)
4. Using a well labelled diagram, describe the ECG waves and intervals. 10 Marks

SECTION THREE LONG ANSWER QUESTIONS (SAQ) (ANSWER ONLY ONE)

1. Discuss the transport of gases in the body under the following headings (20 marks):
    a) Oxygen transport (10 Marks)
    b) Carbon dioxide transport (10 Marks)
2. Explain the 12 pairs of cranial nerves, indicating whether sensory or motor, and where they emerge from the brain (20 marks)