(University of Choice)

# MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

STAR ANNEX

## UNIVERSITY EXAMINATIONS 2021/2022 ACADEMIC YEAR

## FIRST YEAR SECOND TRIMESTER EXAMINATIONS

## FOR THE DEGREE OF BACHELOR OF SCIENCE IN NURSING (DL)

**COURSE CODE:** NCD 122

**COURSE TITLE:** MEDICAL PHYSIOLOGY III

**DATE:** TUESDAY, 19 APRIL, 2022 TIME: 11.30AM – 2.30PM

### INSTRUCTIONS TO CANDIDATES

1. Enter your examination number and course code in the space provided in the answer sheet
2. For Part One MCQ, **write** the correct answer in the answer sheet provided
3. Each MCQ is 1 mark
4. For Part Two, Short answer questions, answer each question following each other
5. For part three, Long Answer questions, answer all the questions
6. The exam takes 3 hours

## SECTION A: MULTIPLE CHOICE QUESTIONS (MCQS); 20 MARKS

***Choose the most appropriate answer which gives you (1 mark)***

Q1. The following are effects of slow, shallow breathing in the human body EXCEPT

a. Allows $CO_2$ to accumulate in the blood
b. Quickly flushes out $CO_2$ out of the blood
c. Increases carbonic acid levels
d. Increases blood PH level

Q2. The following is not true about factors influencing the rate and depth of breathing?

a. Inspiratory depth is influenced by how actively the respiratory center stimulates the motor neurons serving the respiratory muscles
b. The greater the stimulation, the greater the number of motor units exited and the greater the force of respiratory muscle contraction
c. Depth and rate of breathing can be modified in response to changing body demands
d. Respiratory centers in the medulla and pons are only sensitive to inhibitory stimuli

Q3. Which of the following is the function of the surfactant factor produced by the alveolar type 2 cells?

a. The surfactant mixes with alveolar fluid and lowers the surface tension
b. The surfactant mixes with alveolar fluid and increases the surface tension
c. The surfactant mixes with lung fluid and lowers the surface tension
d. The surfactant mixes with lung fluid and lowers the surface tension

Q4. The following statements are true about the mechanics of breathing EXCEPT

a. Pressure is caused by gas molecules striking the walls of a container
b. In a larger volume, the gas molecules strike the wall less frequently, thus exerting less pressure
c. In a smaller sphere the molecules strike the walls less frequently, thus exerting less pressure
d. The pressure of a gas is inversely proportional to the volume of its container

Q5. In regulation of respiration,

a. The central chemoreceptors in medulla senses changes in PO2 and H + levels
b. Peripheral chemoreceptors in aortic and carotid bodies senses changes in PCO2 level
c. The central chemoreceptors in medulla senses changes in alveolar fluid levels
d. Peripheral chemoreceptors in aortic and carotid bodies senses changes in PO2

Q6. Poor alveolar ventilation results in,

a. Low oxygen and high carbon dioxide levels in the alveoli

b. High oxygen and low carbon dioxide levels in the alveoli
c. Low oxygen and low carbon dioxide levels in the alveoli
d. High oxygen and high carbon dioxide levels in the alveoli

Q7: Ischemic (stagnant) hypoxia,

a. Reflects poor O2 delivery resulting from too few RBCs or from RBCs that contain abnormal or too little Hb.
b. Results when blood circulation is impaired or blocked
c. Occurs when body cells are unable to use O2 even though adequate amounts are delivered.
d. Is indicated by reduced arterial PO2

Q8. The following statements are true of carbon monoxide poisoning EXCEPT?

a. The victim is confused and has a throbbing headache
b. Is treated with 100% Oxygen or Hyperbaric therapy if available until carbon monoxide is cleared from the body
c. In rare cases, fair skin becomes cherry red
d. The patient is cyanosed and has respiratory distress

Q9. Control/Regulation of the rhythm and rate of breathing is at the respiratory center located in the,

a. Cerebrum
b. Midbrain
c. Pons and the medulla
d. All the above

Q10. Ventral respiratory group of neurons located in the respiratory center;

a. Sends inhibitory impulse to the area of rhythmic respiration
b. Comes into play during overdrive/rapid breathing
c. Contains mainly inspiratory neurons
d. Makes inhalation longer and deeper

Q11. An 11 years old patient comes to doctor with obesity and dwarfism. He needs the administration of:

a. Insulin
b. Growth hormone
c. Glucagon
d. Testosterone

Q12. The concentration of which hormone will increase if the hypothalamus is damaged:

a.ACTH

b. FSH
c. TSH
d. Prolactin

Q13. The hormones that are produced by the placenta are?

a. Human Chorionic Gonadotrophic Hormone (hCG), Progesterone, oestrogen
b. Human Chorionic Somatomammotropin (hCS), oestrogen, Inhibin
c. Human placental lactogen (hPL), Progesterone, Inhibin
d. Inhibin, Oestrogen, Relaxin

Q14. Diabetes insipidus is a deficiency of what hormone

a. Insulin
b. Antidiuretic hormone.
c. Atrial Natiuretic Hormone
d. Aldosterone

Q15. All the following are stimuli of growth hormone release except

a.Exercise
b. Somatostatin
c. Stress
d. Sleep

Q16. Thyroid hormones belong to which class of hormones

a. Steroids
b. Amines
c. Proteins
d. Polypeptites

Q17. Oxytocin secretion promotes all the following except

a. Uterine contraction
b. Milk formation
c. Milk ejection.
d. Myoepithelial cells contraction of mammary glands

Q18. Find the mis-match.

a. Pancreas : somatostatin
b. Thyroid gland : calcitonin
c. Anterior pituitary : thyrotropin releasing hormone
d. Adrenal medulla : catecholamines

Q19. The concentration of which hormone will increase if the hypothalamus is damaged:

a. ACTH
b. FSH
c. TSH
d. Prolactin

Q20. The most powerful and active thyroid hormone is:

a.T3
a. T4
b. reverse T3
c. TSH

## SECTION B: SHORT ANSWER QUESTIONS (SAQS); 40 MARKS

Q1. Outline seven (7) hormones produced by the anterior pituitary gland (7 marks)

Q2. Explain four (4) ways in which respiratory system responds to exercise (8 Marks)

Q3. Describe the breathing cycle (8 marks)

Q4. State seven (7) factors that influence the rate of gas exchange across alveolar membrane (7 marks)

Q5. Explain four (4) ways in which hormones are removed (cleared) from the plasma (8 Marks)

Q6. List four (4) factors affecting Oxytocin secretion (2 marks)

## SECTION C: LONG ESSAY QUESTIONS (LEQS); 40 MARKS

Q1. Regarding the respiratory system;

a. Outline four (4) functions of the respiratory system (4 marks)

b. State four (4) lung capacities/volumes (4 marks)

c. Describe the transport of oxygen and carbon dioxide in the blood (12 marks)

Q2. Regarding the endocrine system, discuss ten (10) roles of hormones (20 Marks)

*END*