TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF MEDICAL SCIENCES

UNIVERSITY EXAMINATION OF DEGREE

BACHELOR OF MEDICAL LABORATORY SCIENCE (BMLS)

AMD **4210: MEDICAL PHYSIOLOGY II**

END OF SEMESTER EXAMINATION **SERIES** MAY 2016 PAPER TWO

TIME 2 HOURS

SECTION A; Attempt all questions in this section

1. You are eating a hot fudge sundae. The pleasant taste information is sensed by your taste buds, which notify your brain. Your brain releases endorphins, which make you feel very good. You now associate the good feeling with hot fudge sundaes, so you eat another hot fudge sundae. Now you feel even better. Which of the following statements is TRUE regarding this scenario?

   a. This is a negative feedback loop because two hot fudge sundaes will make you sick.

   b. This is a positive feedback loop because the results make you feel good.

   c. This is a negative feedback loop because you were doing something bad for your health in the first place, and the result makes the situation worse.

   d. This is a positive feedback loop because the stimulus (eating a hot fudge sundae) and the effect (eating another hot fudge sundae) are the same.

   e. This is a negative feedback loop because the stimulus (eating a hot fudge sundae) and the effect (eating another hot fudge sundae) are the same

2. The two body systems that regulate homeostasis are the:

   a. cardiovascular and respiratory systems

   b. cardiovascular and urinary systems

   c. cardiovascular and endocrine systems

   d. nervous and cardiovascular systems

e. nervous and endocrine systems

3. Homeostasis is the condition in which the body maintains:

    a. The lowest possible energy usage

    b. A relatively stable internal environment, within limits

    c. A static state with no deviation from preset points

    d. A changing state, within an unlimited range

    e. The highest possible energy usage

4. The sum of all chemical reactions that occur in the body is known as

    a. Growth

    b. Reproduction

    c. Metabolism

    d. Differentiation

    e. Homeostasis

5. Which of the following would result from a thyroidectomy (removal of the thyroid gland)?

    a. decreased TSH secretion

    b. increased T3 and thyroxine secretion

    c. increased calcitonin secretion

    d. increased TSH secretion

    e. both b and c apply.

6. A tumor of the beta cells of the pancreatic islets would probably affect the body's ability to:

    a. lower blood glucose level

    b. lower blood calcium level

    c. raise blood calcium level

d. raise blood glucose level

e. raise blood sodium level.

7. Removal of the adenohypophysis would affect all except:

a. adrenal cortex

b. adrenal medulla

c. ovaries

d. mammary glands

e. thyroid gland.

8. Oxytocin:

a. allows milk secretion or "milk let-down"

b. is stored in the pars nervosa (posterior pituitary)

c. is produced by cells in the diencephalon (hypothalamus)

d. exerts important effects during childbirth

e. all of the above

9. If forcefully exhaling as much air as possible after a normal breath, this is

a. tidal volume

b. expiratory reserve volume

c. maximum expiratory flow rate

d. eupnea

e. inspiratory reserve volume

10. For air to enter the lungs during inspiration

a. the pressure inside the lungs must be higher than the atmospheric pressure

b. the pressure inside the lungs must become lower than the atmospheric pressure

c. the pressure inside the lungs must be equal to the atmospheric pressure

d. the diaphragm must be relaxed

e. intrapulmonary pressure must be equal to intrapleural pressure

11. The values (mm Hg) for P_{CO2} and P_{O2} in the interstitial spaces of peripheral tissues are approximately:

a. 60; 40

b. 40; 60

c. 46; 40

d. 66; 46

e. 46; 100

12. Which tunic of an artery contains endothelium?

a.tunica interna/intima

b.tunica media

c.tunica externa

d.tunica adventitia

e.none of the above

13. Which of the following reactions takes place in the systemic capillaries (where CO_2 is ↑and O_2 is ↓)?

a. $Hb + O_2 \rightarrow HbO_2$

b. $Hb + CO_2 \rightarrow HbCO_2$

c. $HbCO_2 \rightarrow Hb + CO_2$

d. $H_2CO_3 \rightarrow HCO_3^- + H^+$

e. None of the above

14. Water molecules on the surface of the alveoli generate surface tension; this force

a. inhibits alveolar collapse

b. assists pulmonary compliance

c. assists elastic recoil

d. resists elastic recoil

e. impairs gas exchange

15. The *most* abundant type of protein in plasma is

a. insulin

b. globulin

c. albumin

d. glycogen

e. fibrinogen

16. Blood returning to the heart from the inferior vena cava would enter the:

a. left atrium

b. right atrium

c.left ventricle

d. right ventricle

e. aorta

17. If the connections between the parasympathetic division of the ANS and the heart were cut, then

a. heart rate would decrease

b. stroke volume would decrease

c. cardiac output would decrease

d. heart rate would increase

e. heart activity would remain unchanged

18. Midway through a normal expiration:

a. intrapleural pressure is below atmospheric pressure and is becoming more negative

b. alveolar pressure is below atmospheric pressure and is becoming more negative

c. alveolar pressure is below atmospheric pressure and is becoming less negative

d. transpulmonary pressure is positive and is decreasing

e. lung volume is increasing

19.Which of the following formulae would correctly calculate residual volume?

a. (inspiratory reserve volume) minus (expiratory reserve volume)

b. (total lung capacity) minus (vital capacity)

c. (functional residual capacity) minus (tidal volume)

d. (functional residual capacity) minus (inspiratory reserve volume)

e. (expiratory reserve volume) minus (tidal volume)

20. Compared to the systemic arteries, the pulmonary arteries are characterized by:

a. carrying blood at a higher blood pressure

b. having a higher resistance to blood flow

c. having a greater tendency for vascular resistance to increase as blood flow and blood pressure increase

d. carrying blood with a higher PCO_2

e. carrying blood with a higher pH

21. Which of the following is a condition in the interstitial fluid of exercising skeletal muscle that favors the unloading of oxygen from hemoglobin?

a. higher temperature than in resting muscle

b. higher pH than in resting muscle

c. higher PO_2 than in resting muscle

d. higher concentration of 2, 3 diphosphoglycerate than in resting skeletal muscle

e. lower concentration of 2, 3 diphosphoglycerate than in resting skeletal muscle

22. The mechanisms of hypoxic vasoconstriction and hypercapnic bronchodilation work together in the lungs to:

a. maintain acid-base balance

b. maintain ventilation-perfusion matching

c. prevent pneumothorax

d. prevent cor pulmonale and the "blue bloater" syndrome

e. cause pulmonary blood vessels to dilate when cardiac output increases

23. During isovolumetric ventricular contraction phase:

a. The mitral and tricuspid valves are close causing second heart sound.
b. The intraventricular pressure is increased without change in ventricular volume
c. The atrioventricular valves bulge into the atria causing a drop in atrial pressure.
d. QRS complex coincides with ventricular contraction.
e. Both b and d

24. Atrial repolarization is expressed as :

a. P wave
b. QRS complex
c. q wave
d. T wave
e. none of the above.

25.Which of the following regions of the GI tract is not characterized by simple columnar epithelium on the mucosal surface?

a. stomach
b. small intestine

c. appendix
d. large intestine

e. anal canal

26.Cells which secrete HCl into the stomach are called:

a. goblet cells.

b. chief(zymogenic)cells.
c. parietal(oxyntic)cells.
d. enterocytes.
e. Paneth cells.

27. Which of the following is characteristic of saliva?

a. Hypotonicity relative to plasma
b. A lower HCO_3^- concentration than plasma
c. The presence of proteases
d. Secretion rate that is increased by vagotomy
e. Modification by the salivary ductal cells involves reabsorption of K^+ and HCO_{35}

28. Which of the following is the site of secretion of gastrin?
a. Gastric antrum
b. Gastric fundus
c. Duodenum
d. Ileum
e. Colon

29. The lining of the inner walls of the heart's chambers is termed the:
a. visceral pericardium
b. serous pericardium
c. epicardium
d. Myocardium
e. endocardium

30. The heart's natural pacemaker is termed the:
a. sinoatrial node
b. atrioventricular node
c. bundle of His/atrioventricular bundle
d. left and right bundle branches
e. Purkinjefibers

Section B

Answer all the questions

31. Name the major function of the pancrease and give details of each of these functions (20marks)

32.a. Describe the functions of the circulatory system (12marks)

32. b. Describe the pulmonary and systemic circulation (8 marks)