

**UNIVERSITY OF SWAZILAND**

**FACULTY OF HEALTH SCIENCES**

**SUPPLEMENTARY EXAMINATION – JULY 2005**

**COURSE CODE : HSC 101**

**COURSE TITLE : HUMAN ANATOMY AND PHYSIOLOGY**

**TIME ALLOWED : 3 HOURS**

**MARKS ALLOCATED : 100**

**INSTRUCTIONS**

- 1. ANSWER ALL FOUR QUESTIONS ON THIS PAPER.**
- 2. EACH QUESTION CARRIES 25 MARKS**
- 3. EACH CORRECT STATEMENT OR FACT CARRIES 1 MARK UNLESS OTHERWISE INDICATED.**
- 4. DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN GRANTED BY THE INVIGILATOR.**

## QUESTION 1

- A. List and explain any five sensory areas of the cerebral cortex. (10)
- B. (i) List the structural components of the peripheral nervous system. (6)  
(ii) Describe the function of each component mentioned in (i) above. (6)
- C. Define these terms :
- (i) End diastolic volume
  - (ii) Exocrine glands
  - (iii) Hormone

## QUESTION 2

Choose the letter that corresponds to the most correct answer e.g 1 = D

1. Blood is composed of formed elements which are suspended in :
  - a. Plasma
  - b. Water
  - c. Marrow
  - d. None of the above
  
2. Human blood grouping is based on what structure found on the cells' plasma membranes?
  - a. Receptors
  - b. Antibodies
  - c. Immunocytes
  - d. Glycoproteins or antigens
  
3. The layer of the heart consisting mainly of cardiac muscle is the:
  - a. Myometrium
  - b. Endocardium
  - c. Pericardium
  - d. Myocardium

4. Mast cell secretion during an immune hypersensitivity reaction is stimulated when antigens combine with:
  - a. Ig G antibodies
  - b. Ig E antibodies
  - c. Ig M antibodies
  - d. Ig A antibodies
5. Increased reabsorption of sodium in the distal tubule is regulated by :
  - a. Antidiuretic hormone
  - b. Vasopressin
  - c. Aldosterone
  - d. Norepinephrine
6. When blood pH is low, it means :
  - a. The acidity of the blood is decreased
  - b. The acidity of the blood is increased
  - c. The person has alkalosis
  - d. The blood acidity is normal
7. What enzyme is produced by the cells of the juxtaglomerular apparatus of the kidneys in response to low arterial blood pressure ?
  - a. Angiotensin
  - b. Renin
  - c. Atrial natriuretic peptide
  - d. Histamine
8. Which of the following receptors respond to a change in arterial blood pressure?
  - a. Chemoreceptors
  - b. Baroreceptors
  - c. Thermoreceptors
  - d. Nociceptors
9. Which is **not** a function of the paranasal sinuses ?
  - a. To fight infectious pathogens
  - b. To lighten the skull
  - c. To warm incoming air
  - d. To moisten incoming air.

10. The lung covering that is in direct contact with the thoracic wall is the :
- Visceral pleura
  - Epicardium
  - Hilus
  - Parietal pleura
11. Boyle's Law states that :
- Gas pressure is directly proportional to its volume
  - At an increase in temperature, the pressure of a gas varies directly with its volume.
  - At constant temperature, the pressure of a gas varies inversely with its volume.
  - At constant temperature, the pressure of a gas varies directly with its volume.
12. The action of the passage of digested end products from the lumen of the gastrointestinal tract into the blood or lymph is called :
- Chemical digestion
  - Propulsion
  - Absorption
  - Defaecation
13. The body fluid composed of lysozyme, digestive enzymes and other components is:
- Saliva
  - Gastric juice
  - Pancreatic juice
  - Urine
14. The process of deglutition refers to :
- Chewing
  - Defaecation
  - Urine formation
  - Swallowing
15. The major stimulus for gallbladder contraction is :
- Hepatopancreatic sphincter
  - Cholecystokinin (CCK)
  - Entrance of fatty chime into the duodenum
  - Parasympathetic impulses via the vagus nerve

16. Which of the following is not a heat promoting mechanism ?
- Blood vessel dilation
  - Shivering
  - Increase in metabolic rate
  - Constriction of cutaneous blood vessel
17. the main artery supplying oxygenated blood to the kidney is the :
- Renal vein
  - Arcuate artery
  - Renal artery
  - Interlobular artery
18. The part of the urinary system that is collapsible and acts as a temporary storage for urine is the
- Urinary bladder
  - Gallbladder
  - Renal pelvis
  - Ureter
19. When the atria contract they pump blood into the ventricles through which structures?
- Semilunar valves
  - Vasa vasorum
  - Aorta
  - Atrio-ventricular valves
20. What structure in the heart is also known as a pacemaker as it sets the sinus rhythm?
- Purkinje fibres
  - Atrioventricular bundle
  - Sinoatrial node
  - Atrioventricular node
21. A sesamoid bone enclosed in the quadriceps tendon and secures the anterior thigh muscles is the:
- Femur
  - Patella
  - Talus
  - Tibia

22. The Achilles tendon of the calf muscles attaches to the posterior surface of which bone?
- Talus
  - Calcaneous
  - Navicular bone
  - Cuboid tarsus
23. The tissue that enables us to be aware of the external environment and to react to it is the :
- Muscle tissue
  - Connective tissue
  - Nervous tissue
  - Epithelium
24. The movement of a solvent such as water through a selectively permeable membrane is referred to as :
- Osmosis
  - Diffusion
  - Active transport
  - Diapedesis
25. The process of moving substances across the plasma membrane into the cell from the extracellular environment is called :
- Exocytosis
  - Vesicular transport
  - Diffusion
  - Endocytosis

[25]

### QUESTION 3

A. Describe the specializations of plasma membranes and their functions. (8)

B. Where in the body are the following laws applied :

i) Boyle's law (4)

ii) Dalton's law (4)

iii) Henry's law (4)

C. How is oxygen transported from the lungs to tissues? (5)

[25]

### QUESTION 4

A. Compare the skeletal, cardiac and smooth muscles. (9)

B. Describe carbohydrates digestion. (9)

C. Discuss the importance of the following survival needs for the body systems' maintenance.

i) Nutrients (2)

ii) Water (2)

iii) Normal body temperature (1)

iv) Atmospheric pressure (2)

[25]