BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE AND ENGINEERING

DEPARTMENT: HEALTH SCIENCES

BACHELOR OF SCIENCE HONORS IN NURSING SCIENCES (NURSING EDUCATION)
BACHELOR OF SCIENCE HONORS IN NURSING SCIENCES (COMMUNITY HEALTH NURSING)

NS 107 (1): HUMAN PHYSIOLOGY II JUN 2025

DURATION: 3 HOURS TOTAL MARKS: 100

Registration number								

INSTRUCTIONS TO CANDIDATES

Answer all questions

Section A carries 50 marks.

Answer all questions by ENCIRCLING True (T) or False (F) using a pen on the question paper.

1. **Indicate whether the following statements are true (T) or false (F)**

a) Proprioceptors inform us where our body is in space (T), (F)
b) Pain is an unpleasant or emotional experience associated with actual or potential tissue damage (T),(F)
c) Pain stimulation is carried by small, slow fibers that enter the dorsal horn of the spinal cord; then other cells transmit the impulses from the spinal cord up to the brain (T),(F)
d) Endorphins system does not act on membrane receptors located on the cell bodies of the spinothalamic tract (T),(F)
e) Vestibular gives rise to the sensation of movement (T),(F)

2. **Indicate whether the following statements are true (T) or false (F).**

a) Tidal volume is volume of air inspired or expired during a normal inspiration or expiration (T), (F)
b) Inspiratory reserve volume is the amount of air inspired forcefully after inspiration of normal tidal volume (T), (F)
c) Lung compliance is the change in lung volume per unit change in airway pressure (T), (F)
d) The spinal nerve supplying the diaphragm is the median nerve (T), (F)
e) Total lung capacity is the volume of air in the lung system after maximum inspiration (T), (F)

3. **Indicate whether the following statements are true (T) or false (F)**

a) Carbonic anhydrase is an enzyme housed in the kidney responsible for breakdown of carbonic acid (T), (F)
b) Respiratory acidosis may be caused by asthma or antiretroviral side effects (T), (F)
c) Bicarbonate plays an important role in acid base balance (T), (F)
d) Parathyroid hormone increases calcium reabsorption in the distal tubule (T), (F)
e) Aldosterone inhibits potassium secretion in the distal convoluted tubules (T),(F)

4. **Indicate whether the following statements are true (T) or false (F)**

a) The kidney is involved in the regulation of fluid (T),(F)
b) A kidney has only excretory and regulatory functions (T), (F)
c) The kidney is involved in red blood cell production (T), (F)
d) Ureamia is the excess of nitrogenous compounds in the body (T),(F)
e) Reabsorption is the process of urine formation

which happens in the glomerulus (T),(F)

5. Indicate whether the following statements are true (T) or false (F)

a) Muscarinic receptors are activated by acetylcholine (T),(F)

b) The only photoreceptors are the rods and cones of the retina (T),(F)

c) Synapse is the space between dendrites of neurons (T),(F)

d) Dopamine is a biogenic amine involved in psychomotor agitation (T),(F)

e) Acetylcholine is a neurotransmitter that causes slow gait (T),(F)

6. Indicate whether the following statements are true (T) or false (F)

a) The kidneys are essential for regulating the volume and composition of body fluids. (T),(F)

b) The pH of body fluids is controlled by the respiratory system alone (T),(F)

c) When the osmolality increases above normal, aldosterone secretion is inhibited. (T),(F)

d) Excess of aldosterone causes less sodium to be reabsorbed in the distal tubule. (T),(F)

e) A negative algorithm of hydrogen ions means acidity (T),(F)

7. Indicate whether the following statements are true (T) or false (F)

a) Carbonic anhydrase causes breakdown of carbonic acid (T), (F)

b) Alkalosis may be caused by excess perfusion of oxygen (T), (F)

c) Ammonium chloride plays an important role in acid base balance (T), (F)

d) Thyroid hormone increase calcium reabsorption in the distal tubule (T), (F)

e) Aldosterone inhibits sodium reabsorption in the

distal convoluted tubules (T),(F)

8. Indicate whether the following statements are true (T) or false (F).

a) Glucagon secretion increases during exercise to promote liver glycogenolysis (T),(F)

b) Epinephrine increases glycogenolysis (T) (F)

c) Cortisol levels can initiate gluconeogenesis. (T),(F)

d) Thyroid hormones mobilizes free fatty acids (T),(F)

e) Parathyroid hormone promotes glucose catabolism (T),(F)

9. Indicate whether the following statements are true (T) or false (F).

a) Pain is not an objective experience (T),(F)

b) Use of synthetic opioids cannot alter pain perception (T),(F)

c) Nociceptors are not implicated in pain perception (T),(F)

d) Inflammation can contribute to the amount of pain experienced by an individual (T),(F)

e) Gender plays an important role in response to pain. (T),(F)

10. Indicate whether the following statements are true (T) or false (F)

a) The kidneys and the respiratory system are essential for regulating acid base balance (T),(F)

b) The pH of body fluids is controlled by the renal system alone (T),(F)

c) When the osmolality increases above normal, renin secretion is inhibited. (T),(F)

d) Excess of aldosterone causes the rise in blood pressure (T),(F)

e) Hydrogen ions are produced during glucose metabolism (T),(F)

0.Section B: Carries 50 marks

Answer all the questions

1.a) Differentiate between positive feedback and negative feedback, giving examples. (5Marks)

b) Describe the classification of hormones. (10Marks)

c) Explain how the following hormones contribute to homeostasis:

i. Parathyroid

ii. ADH

iii. Thyroid hormone (10Marks)

2.a) Outline the characteristics of the kidney that make it suitable to transport Na+, Cl-, and water. (5Marks)

b) Describe the Bolye's laws and its application to the mechanism of respirations (10marks)

c) Explain how the RAAS system works. (10Mark)

END OF PAPER