

BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE AND ENGINEERING

DEPARTMENT: HEALTH SCIENCES

BACHELOR OF SCIENCE HONORS IN NURSING SCIENCES (NURSING EDUCATION)

NS107 (1): HUMAN PHYSIOLOGY II

DURATION: 3 HOURS

TOTAL MARKS:100

Registration number								
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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).

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

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

- The kidney is involved in the maintenance of acid base balance(T), (F)
- A kidney has excretory, endocrine and regulatory functions(T), (F)

- c) Erythropoietin is a hormone synthesized by the kidney when anaemic (T),(F)
- d) Urea is the end product of nitrogen metabolism (T), (F)
- e) Filtration is the process of urine formation which happens in the glomerulus (T), (F)
3. Indicate whether the following statements are true (T) or false (F)
- a) Epinephrine and norepinephrine are the primary catecholamines synthesized by the adrenal gland (T), (F)
- b) Glucagon increases insulin secretion (T),(F)
- c) Thyroid hormones are necessary for normal growth and development (T),(F)
- d) Insulin increases uptake of glucose cells (T),(F)
- e) Positive feedback results in decrease in release of hormones (T),(F)
4. Indicate whether the following statements are true (T) or false (F)
- a) The only photoreceptors are the rods and cones of the retina (T),(F)
- b) Muscarinic receptors are activated by acetylcholine (T), (F)
- c) Synapse is the space between dendrites of neurons (T),(F)
- d) Dopamine is a biogenic amine involved in psychomotor retardation(T),(F)
- e) Gama amino butyric acid is implicated in epilepsy (T), (F)
5. 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 increase calcium reabsorption in the distal tubule (T), (F)
- e) Aldosterone inhibits potassium secretion in the distal convoluted tubules (T), (F)

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

- a) These are sites of communication between neurons:
 - i) Astrocyte (T), (F)
 - ii) Ganglia (T), (F)
 - iii) Synapse (T), (F)
- b) The reflex arch allows for an automatic response (T), (F)
- c) Sympathetic and parasympathetic divisions typically function in opposition to each other. (T), (F)

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

- a) Glucagon secretion increases during exercise to promote liver glycogen breakdown (glycogenolysis) (T), (F)
- b) Epinephrine and Norepinephrine further increase glycogenolysis (T) (F)
- c) Cortisol levels can initiate gluconeogenesis. (T), (F)
- d) Growth Hormone mobilizes free fatty acids (T), (F)
- e) Thyroxine promotes glucose catabolism (T), (F)

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

- a) Pain is an objective experience (T), (F)
- b) Use of nonsteroidal drugs can alter pain perception (T), (F)

- c) Nociceptors are implicated in pain perception (T),(F)
- d) Culture does not have a role in response to pain (T),(F)
- e) Gender plays an important role in response to pain (T),(F)
9. Indicate whether the following statements are true (T) or false (F)
- a) The kidneys are essential for regulating the volume and composition of bodily 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)
10. Indicate whether the following statements are true (T) or false (F)
- a) Sympathetic nervous system can cause
- i. "Rest and digest" (T),(F)
- ii. Exercise, excitement, emergency, and embarrassment (T),(F)
- b) Parasympathetic nervous system can cause
- i. "Fight or flight" (T),(F)
- ii. "D" division (T),(F)
- iii. Digestion, defecation, and diuresis (T),(F)

Section B: Carries 50 marks

Answer all the questions.

1. (a)(a). Describe the Boyle's laws and its application to the mechanism of respiration [10marks]
- (b) Outline the functions of the respiratory system [15marks]

2. Describe the negative feedback mechanism of thyroid hormone production
[25 marks]

END OF PAPER