



**SOLOMON ISLANDS NATIONAL UNIVERSITY**  
**School of Nursing and Allied Health Sciences**  
**Diploma of Public Health (Health Promotion)**

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**HP 611 – BASIC APPLIED PHYSIOLOGY**

**FINAL EXAMINATION**

**SEMESTER 1, 2017**



NAME:

STUDENT I.D:

SOLOMON ISLANDS NATIONAL UNIVERSITY

SCHOOL OF NURSING AND ALLIED HEALTH SCIENCES

UNIT NAME: HUMAN ANATOMY & PHYSIOLOGY 1

UNIT CODE NO: PH 611

PROGRAMME NAME: DIPLOMA OF PUBLIC HEALTH

This examination carries 30% of the total Assessment for this unit

Examination 2:

Current

Deferred/Supplementary

Internal

Examiners/Moderators: Reuben Maau

Time Allowed:

Perusal: Ten (10) minutes

Working: Two hours (2 hrs)

Examination Date: 08/06/17

Time: 9:00 am

**Special Instructions:**

Communication of any kind about any matter between students by any means whatsoever is strictly prohibited from the time that students enter the examination room until they exit at the completion of the examination. This includes any temporary absence from the examination room during the examination. Any such communication will be deemed to be cheating and treated as serious academic misconduct under SINU – School of Nursing & Allied Health Sciences Academic Regulation

The paper consists of Two Parts – MCQ & Short & Long Answer questions:

	Potential score	Score
PART A: MCQ's	Marks 63	
PART B: Short & Long Answer Questions	Marks 30	
TOTAL	93	
		%

- Welcome to the HP 611 & NU 611 Examination
- This is a **CLOSED** examination
- Students **are permitted** to write on the examination paper during perusal time.
- Students are only allowed to leave the examination room after one hour & to leave 15 mins before end of the exam
- Please write your **name** and **ID number** on the space provided
- Do not** use red pen and correctional fluids
- Attempt all questions**, should the space provided is not enough, use the back of the page but please indicate it.
- Please Circle the most correct answer**

*Best of luck*

**PART A: MULTIPLE CHOICE QUESTIONS – MCQ****(63 MARKS)**

1. **The Renal system works with \_\_\_\_\_ and the \_\_\_\_\_ systems:**
  - (a) Respiratory, GIT
  - (b) Cardiovascular, Endocrine
  - (c) Respiratory, Cardiovascular
  - (d) Endocrine, GIT
2. **The functional unit of the kidneys are the:**
  - (a) Bowmans capsule
  - (b) Nephrons
  - (c) Loop of Henle
  - (d) Collecting ducts
3. **The function of the ureter of the renal system is to:**
  - (a) Deliver urine to the urethra
  - (b) Deliver urine to the collecting ducts
  - (c) Deliver urine to the bladder
  - (d) None of the above
4. **The organ that stores urine is the:**
  - (a) Bladder
  - (b) Ureters
  - (c) Urethra
  - (d) All of the above
5. **The structure of the kidneys are in the following order – from the outer covering to the inner region**
  - (a) Renal capsule, renal cortex, medulla
  - (b) Medullar, renal cortex, renal capsule
  - (c) Renal cortex, medullar, renal capsule
  - (d) Renal capsule, medulla, renal cortex
6. **There are two types of nephrons in the kidneys. They are referred to as the:**
  - (a) Convoluted and proximal tubules
  - (b) Cortical and loop of Henle
  - (c) Cortical and juxtamedullary
  - (d) Juxtamedullary and distal tubules
7. **Kidney filtration occurs in the:**
  - (a) Proximal tubules
  - (b) Loop of Henle
  - (c) Distal tubules
  - (d) Glomerulus
8. **The fluid in the kidneys drains through the following structures of the nephrons from the glomerulus to the urine ducts:**
  - (a) Distal tubules, loop of Henle & proximal tubules
  - (b) Loop of Henle, distal tubules, proximal tubules
  - (c) Proximal tubules, loop of Henle, distal tubules
  - (d) None of the above
9. **The blood vessel that brings blood to the glomerulus is known as the:**
  - (a) Efferent arteriole
  - (b) Afferent arteriole
  - (c) Efferent and Afferent arterioles
  - (d) None of the above
10. **The term 'Fenestration' filtration in the glomerulus prevents filtration of:**
  - (a) Larger proteins
  - (b) Medium size proteins
  - (c) Blood cells
  - (d) All of the above
11. **Low blood pressure in the kidneys causes the macula densa cells to regulate the release of \_\_\_\_\_ from the juxtamedullary cells. This is in order for the reabsorption of Na and water.**
  - (a) Renin
  - (b) Aquaporins
  - (c) Renin and aquaporins
  - (d) None of the above
12. **In the kidneys, the total glomerular filtration rate of fluid for men is \_\_\_\_\_ and for women is \_\_\_\_\_.**
  - (a) 150 l/day; 180 l/day
  - (b) 180 l/day; 150 l/day
  - (c) 125 l/day; 90 l/day
  - (d) 180 l/day; 100 l/day
13. **From the above glomerular filtration rate, only \_\_\_\_\_ of urine is being produced per day.**
  - (a) 3 – 4 liters
  - (b) 4 – 5 liters
  - (c) 1 – 2 liters
  - (d) 500 mls only

<p><b>14. The order of the process of urine formation is:</b></p> <ul style="list-style-type: none"> <li>(a) Filtration, reabsorption and secretion</li> <li>(b) Secretion, filtration and reabsorption</li> <li>(c) Reabsorption, secretion and filtration</li> <li>(d) Filtration, secretion and reabsorption</li> </ul> <p><b>15. The term 'Homeostasis' refers to:</b></p> <ul style="list-style-type: none"> <li>(a) The cell activity of the body to maintain physiological state</li> <li>(b) Negative feedback</li> <li>(c) Positive feedback</li> <li>(d) Negative and positive feedback</li> </ul> <p><b>16. The major anion in extracellular fluid is _____.</b></p> <ul style="list-style-type: none"> <li>(a) Sodium</li> <li>(b) Potassium</li> <li>(c) Chloride</li> <li>(d) Bicarbonate</li> </ul> <p><b>17. Most of the body's calcium is found in _____.</b></p> <ul style="list-style-type: none"> <li>(a) Teeth</li> <li>(b) Bone</li> <li>(c) Plasma</li> <li>(d) Extracellular fluids</li> </ul> <p><b>18. Abnormally increased blood levels of sodium are termed;</b></p> <ul style="list-style-type: none"> <li>(a) Hyperkalemia</li> <li>(b) Hyperchloremia</li> <li>(c) Hybernatremia</li> <li>(d) Hypercalcemia</li> </ul> <p><b>19. The ion with the lowest blood level is;</b></p> <ul style="list-style-type: none"> <li>(a) Sodium</li> <li>(b) Potassium</li> <li>(c) Chloride</li> <li>(d) Bicarbonate</li> </ul> <p><b>20. Which two ions are most affected by aldosterone?</b></p> <ul style="list-style-type: none"> <li>(a) Sodium and potassium</li> <li>(b) Chloride and bicarbonate</li> <li>(c) Calcium and phosphate</li> <li>(d) Sodium and phosphate</li> </ul>	<p><b>21. Which of the following is the most important buffer inside red blood cells?</b></p> <ul style="list-style-type: none"> <li>(a) plasma proteins</li> <li>(b) hemoglobin</li> <li>(c) phosphate buffers</li> <li>(d) bicarbonate: carbonic acid buffer</li> </ul> <p><b>22. Which explanation best describes why plasma proteins can function as buffers?</b></p> <ul style="list-style-type: none"> <li>(a) Plasma proteins combine with bicarbonate to make a stronger buffer.</li> <li>(b) Plasma proteins are immune to damage from acids.</li> <li>(c) Proteins have both positive and negative charges on their surface.</li> <li>(d) Proteins are alkaline.</li> </ul> <p><b>23. The buffer that is adjusted to control acid-base balance is;</b></p> <ul style="list-style-type: none"> <li>(a) Plasma protein</li> <li>(b) Hemoglobin</li> <li>(c) Phosphate buffer</li> <li>(d) Bicarbonate: carbonic acid buffer</li> </ul> <p><b>24. Carbonic acid levels are controlled through the;</b></p> <ul style="list-style-type: none"> <li>(a) Respiratory system</li> <li>(b) Renal system</li> <li>(c) Digestive system</li> <li>(d) Metabolic rate of cells</li> </ul> <p><b>25. Bicarbonate ion concentrations in the blood are controlled through the;</b></p> <ul style="list-style-type: none"> <li>(a) Respiratory system</li> <li>(b) Renal system</li> <li>(c) Digestive system</li> <li>(d) Metabolic rate of cells</li> </ul> <p><b>26. The largest amount of water comes into the body via;</b></p> <ul style="list-style-type: none"> <li>(a) Metabolism</li> <li>(b) Foods</li> <li>(c) Liquids</li> <li>(d) Humidified air</li> </ul>
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<p><b>27. The largest amount of water leaves the body via;</b></p> <ul style="list-style-type: none"> <li>(a) The GI tract</li> <li>(b) The skin as sweat</li> <li>(c) Expiration</li> <li>(d) Urine</li> </ul> <p><b>28. Insensible water loss is water lost via;</b></p> <ul style="list-style-type: none"> <li>(a) Skin evaporation and in air from the lungs</li> <li>(b) Urine</li> <li>(c) Excessive sweating</li> <li>(d) Vomiting or diarrhea</li> </ul> <p><b>29. How soon after drinking a large glass of water will a person start increasing their urine output?</b></p> <ul style="list-style-type: none"> <li>(a) 5 minutes</li> <li>(b) 30 minutes</li> <li>(c) 1 hour</li> <li>(d) 3 hours</li> </ul> <p><b>30. Which of the following is a cause of metabolic acidosis?</b></p> <ul style="list-style-type: none"> <li>(a) Excessive hcl loss</li> <li>(b) Increased aldosterone</li> <li>(c) Diarrhea</li> <li>(d) Prolonged use of diuretics</li> </ul> <p><b>31. Which of the following is a cause of respiratory acidosis?</b></p> <ul style="list-style-type: none"> <li>(a) Emphysema</li> <li>(b) Low blood <math>k^+</math></li> <li>(c) Increased aldosterone</li> <li>(d) Increased blood ketones</li> </ul> <p><b>32. The normal blood pH is between:</b></p> <ul style="list-style-type: none"> <li>(a) 7.35 – 7.50</li> <li>(b) 7.35 – 7.45</li> <li>(c) 7.0 – 8.0</li> <li>(d) 7.45 – 7.55</li> </ul> <p><b>33. Which of the following is <u>NOT</u> directly associated with the lymphatic pathway?</b></p> <ul style="list-style-type: none"> <li>(a) Lymphatic trunk</li> <li>(b) Collecting ducts</li> <li>(c) Subclavian vein</li> <li>(d) Carotid arteries</li> </ul>	<p><b>34. The thymus is located within the;</b></p> <ul style="list-style-type: none"> <li>(a) Mediastinum</li> <li>(b) Peristinum</li> <li>(c) Epistinum</li> <li>(d) Endostinum</li> </ul> <p><b>35. The redness and heat of an inflamed area are due to a local hyperemia caused by;</b></p> <ul style="list-style-type: none"> <li>(a) Vasodilation</li> <li>(b) Vasoconstriction</li> <li>(c) Phagocyte mobilization</li> <li>(d) Production of complement and interferon</li> </ul> <p><b>36. An example of an inflammatory mediator that stimulates vasodilation is;</b></p> <ul style="list-style-type: none"> <li>(a) Histamine</li> <li>(b) Collagen</li> <li>(c) Complement c5a</li> <li>(d) Interferon</li> </ul> <p><b>37. An example of a nonspecific chemical barrier to infection is;</b></p> <ul style="list-style-type: none"> <li>(a) Unbroken skin</li> <li>(b) Lysozyme in saliva</li> <li>(c) Cilia in the respiratory tract</li> <li>(d) Cytotoxic t cells</li> </ul> <p><b>38. Fever;</b></p> <ul style="list-style-type: none"> <li>(a) Is a higher-than-normal body temperature that is always dangerous</li> <li>(b) Decreases the metabolic rate of the body to conserve energy</li> <li>(c) Production is regulated by chemicals that reset the body's thermostat to a higher setting</li> <li>(d) Causes the liver to release large amounts of iron, which seems to inhibit bacterial replication</li> </ul>
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<p><b>39. Which of the following types of immunoglobulins is the most responsible for promoting allergic reactions?</b></p> <p>(a) IgA (b) IgM (c) IgD (d) IgE</p> <p><b>40. Lymphocytes that reach the thymus become;</b></p> <p>(a) T-cells (b) B-cells (c) Plasma cells (d) Beta cells</p> <p><b>41. Which of the following is not a primary target group of T cells?</b></p> <p>(a) Viruses (b) Toxins (c) Fungi (d) TB</p> <p><b>42. Which of the following is a characteristic of antibodies?</b></p> <p>(a) Carbohydrate structure (b) Composed of heavy and light polypeptide chains (c) Three binding sites per antibody monomer (d) Incapable of being transferred from one person to another</p> <p><b>43. Which of the following is associated with passive immunity?</b></p> <p>(a) Exposure to an antigen (b) Infusion of weakened viruses (c) Passage of IgG antibodies from a pregnant mother to her fetus (d) Booster shot of vaccine</p> <p><b>44. Which of the following is <u>NOT</u> a type of T cell?.</b></p> <p>(a) Cytotoxic (b) Antigenic (c) Helper (d) Regulatory</p>	<p><b>45. Which of the following statements regarding NK cells is a false or incorrect statement?</b></p> <p>(a) NK cells are a type of neutrophil (b) NK cells are present in the blood, spleen, lymph nodes, and red bone marrow. (c) NK cells attack cells that display abnormal MHC antigens. (d) NK cells attack cancer cells and virus-infected body cells.</p> <p><b>46. Which of the following is <u>NOT</u> a phagocyte?</b></p> <p>(a) Mast cell (b) Dendritic Cell (c) Neutrophil (d) Natural Killer Cell</p> <p><b>47. Natural killer (NK) cells,</b></p> <p>(a) Are also called cytotoxic T cells (b) Are a type of phagocyte (c) Are cells of the adaptive immune system (d) Can kill cancer cells before the immune system is activated</p> <p><b>48. The process whereby neutrophils and other white blood cells are attracted to an inflammatory site is called;</b></p> <p>(a) Diapedesis (b) Chemotaxis (c) Margination (d) Phagocytosis</p> <p><b>49. Which of the following is the correct sequence of events in phagocytosis?</b></p> <p>(a) Adherence, Digestion, Killing, Ingestion, Chemotaxis (b) Chemotaxis, Ingestion, Digestion, Adherence, Killing (c) Chemotaxis, Adherence, Ingestion, Digestion, Killing (d) Ingestion, Adherence, Chemotaxis, Digestion, Killing</p> <p><b>50. Interferons;</b></p> <p>(a) Are virus-specific, so that an interferon produced against one virus could not protect cells against another virus (b) Act by increasing the rate of cell division (c) Interfere with viral replication within cells (d) Are routinely used in nasal sprays for the common cold</p>
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<p><b>51. The endocrine glands like the nervous system plays a role in hormone communication. It receives stimuli through the nervous system and secretes its hormones through the _____ to effect its function.</b></p> <p>(a) Neurons  (b) Blood stream  (c) Cells  (d) All of the above</p> <p><b>52. The endocrine gland that is known as the 'Master Gland' is:</b></p> <p>(a) Hypothalamus  (b) Male &amp; female gonads  (c) Pituitary glands  (d) Pancreas</p> <p><b>53. The thyroid hormones that are responsible for increasing the metabolic rate are:</b></p> <p>(a) T3 &amp; T4  (b) T3 &amp; Calcitonin  (c) Calcitonin &amp; T4  (d) None of the above</p> <p><b>54. Calcium and phosphate are being regulated by the _____ hormone.</b></p> <p>(a) Parathyroid  (b) Thyroid stimulating  (c) Follicle stimulating  (d) Testosterone</p> <p><b>55. The Beta cells of the pancreas secretes _____ hormone.</b></p> <p>(a) Glucagon  (b) Insulin  (c) Somatostatin  (d) None of the above</p> <p><b>56. The bones of the musculoskeletal system are made of;</b></p> <p>(a) Calcium only  (b) Collagen only  (c) Collagen and calcium  (d) Sodium</p>	<p><b>57. The female's reproductive role is to produce ova, while male reproductive role is to produce:</b></p> <p>(a) Egg  (b) Sperm  (c) Egg and sperm  (d) Nutrition</p> <p><b>58. The tube in male reproductive system that stores sperms that is 20 feet long is known as the:</b></p> <p>(a) Sperm duct  (b) Urethra  (c) Seminiferous tubules  (d) Epididymis</p> <p><b>59. The female sex hormones are:</b></p> <p>(a) Estrogen and progesterone  (b) Estrogen and testosterone  (c) Testosterone and progesterone  (d) Spermatozoa and ova</p> <p><b>60. The structures of the middle ear are:</b></p> <p>(a) Cochlear and semicircular  (b) Malleus, incus and stapes  (c) Malleus, incus and cochlear  (d) Incus, cochlear and semicircular</p> <p><b>61. The nerve that is responsible to transmit the sense of smell for interpretation is;</b></p> <p>(a) Abducen  (b) Auditory  (c) Olfactory  (d) Trochlear</p> <p><b>62. The tip of the tongue is used to taste</b></p> <p>(a) Sweet  (b) Salt  (c) Sour  (d) Bitter</p> <p><b>63. The opening of the eye that regulate the amount of light in to the eye is the:</b></p> <p>(a) Lens  (b) Cornea  (c) Pupil  (d) Conjunctivae</p>
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**1. Describe the five (5) processes or stages of Phagocytosis.**

**(10 Marks)**

a. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

b. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

c. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

d. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

e. \_\_\_\_\_  
\_\_\_\_\_  
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2. Fever is a natural mechanism of the human body to fight invading micro-organisms. Describe the benefits of fever of how it helps in destroying micro-organisms.

(4 Marks)

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3. Explain in your own words how the renal system through the Renin Angiotensinogen mechanism maintains a normal blood pressure when the blood pressure and blood volume drops below normal. (10 Marks)

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4. Outline the three functions of the lymphatic system (6 Marks)

a.

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b.

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c.

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