



**CENTRAL  
UNIVERSITY**

FAITH • INTEGRITY • EXCELLENCE

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**SCHOOL OF MEDICINE & HEALTH SCIENCES  
DEPARTMENT OF PHYSICIAN ASSISTANTSHIP  
STUDIES**

**END OF SEMESTER EXAMINATIONS  
MAY 2022**

*COURSE TITLE: HUMAN PHYSIOLOGY &  
PATHOPHYSIOLOGY (PHAS 125)*

**TIME ALLOWED: 3 HRS (180 MINUTES)**

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**INSTRUCTIONS:**

Attempt ALL questions by shading the appropriate answer on the scantron sheet.

Repeat answers on the question paper, which will be collected at the exams.

*The use of mobile phones during examination is **STRICTLY** forbidden*

**DO NOT TURN OVER THIS PAGE UNTIL YOU ARE TOLD TO  
DO SO BY THE INVIGILATOR.**

## CELL, MUSCLE & CARDIOVASCULAR PHYSIOLOGY

**INSTRUCTION:** Questions 1 to 20; For each of the descriptions/statements below choose the most appropriate option from the list provided (a – d).

1. Consider two aqueous solutions of different concentration separated by a semi-permeable membrane. In this situation, osmosis results in:
  - a. The more concentrated solution becomes even more concentrated
  - b. The more dilute solution becomes even more dilute
  - c. Water molecules moves from the solution with lower water concentration into the solution of higher water concentration
  - d. Water molecules moves from the solution of lower particle concentration into the solution of higher particle concentration
  
2. Which of the following best describes osmosis?
  - a. Solute particles move from the solution of higher particle concentration into the solution of lower particle concentration
  - b. Water flow from the solution with higher osmotic pressure to the solution of lower osmotic pressure
  - c. Water flow from the solution with lower osmotic pressure to the solution of higher osmotic pressure
  - d. Water molecules moves from the solution with lower water concentration into the solution of higher water concentration
  
3. During diffusion by a cation into a cell through open ion channels, increasing temperature is likely to;
  - a. increase rate of influx
  - b. decrease rate of influx
  - c. have no effect on rate of influx
  - d. increase rate of efflux
  
4. During diffusion by a cation into a cell through open ion channels. decreasing the membrane potential is likely to;
  - a. increase rate of influx
  - b. decrease rate of influx
  - c. have no effect on rate of influx
  - d. increase rate of efflux

5. Human blood has an osmolarity that lies within the range 280–300 mOsm/L. Consider a patient undergoing intravenous infusion, which of the following statements can be correctly said of the type of intravenous solution he/she receives?
- A hypertonic solution received by the patient will have osmolarity greater than that of red blood cells
  - A hypertonic solution received by the patient will causes no net movement of water through the membrane of red blood cells
  - An isotonic solution received by the patient will have osmolarity slightly lesser than that of red blood cells
  - A hypotonic solution received by the patient will have osmolarity between 280 and 300 mOsm/L
6. In homeostasis, which of the following statement is INCORRECT.
- Positive feedback is the way the body maintains a dynamic state of equilibrium
  - Positive feedback is a response that enhances a stimulus
  - The hypothalamus and core thermoreceptors notice if body temperature is too low. The hypothalamus signals smooth muscle in blood vessels to vasoconstrict and skeletal muscle to shiver
  - Negative feedback opposes changes in a physiological variable that are directed away from the set point for that variable
7. In homeostasis, which of the following statement is CORRECT.
- The effector produces the response that moves the physiological variable back towards the middle of its healthy range
  - The afferent pathway in the description of a feedback loop in homeostasis, refers to the outgoing signal
  - The nerve(s) that connect the brain to the blood vessels of the skin is the efferent pathway for the control of blood glucose level.
  - The parasympathetic nerve(s) that send impulse from the brain to the contractile cells of the heart is the afferent pathway for the control of body pressure.
8. Regarding the electrical activity of the neuron, which of the following statement is CORRECT:
- Voltage change that occurs along the cell membrane of the dendrite and cell body produces a graded potential
  - The rapid influx of  $\text{Na}^+$  across the cell membrane, followed by the efflux of  $\text{K}^+$  via voltage gated channels describes a “resting potential”.
  - At refractory period, movement of a neurotransmitter from the presynaptic membrane to the postsynaptic membrane occurs across the synapse.
  - In nerve fibres with myelin sheaths, electrical conduction requires more energy to send an impulse.

9. Regarding changes in membrane potential of a cell, which of the following statement is CORRECT:

- a. A change in membrane potential from about  $-70$  mV to about  $+30$  mV can be caused by  $\text{Na}^+$  ions moving into the cell
- b. A change in membrane potential from about  $-50$  mV to about  $-25$  mV can be caused by  $\text{K}^+$  ions moving out of the cell
- c. A change in membrane potential from about  $-50$  mV to about  $-40$  mV can be caused by  $\text{Na}^+$  ions moving out of the cell
- d. A change in membrane potential from about  $+20$  mV to about  $-20$  mV can be caused by  $\text{K}^+$  ions moving out of the cell

10. Regarding the electrical activity of the neuron, which of the following statement is INCORRECT:

- a. An action potential is an all or none response
- b. In nerve fibres with myelin sheaths, electrical conduction propagates at higher speed.
- c. Depolarisation of the cell membrane involves sodium channels opening to allow  $\text{Na}^+$  to influx
- d. The rapid influx of  $\text{Na}^+$  across the cell membrane, followed by the efflux of  $\text{Ca}^+$  via voltage gated channels describes a graded potential.

11. During muscle contraction, which of the following statement is CORRECT:

- a.  $\text{Ca}^{2+}$  attaches to the myosin head, causing it to disengage from its binding site
- b. Thick myofilaments contain the three proteins myosin, tropomyosin, and troponin
- c. Calcium ions in muscle contraction bind to troponin, thus changing its shape and pulling it away from the actin molecule
- d. The movement of  $\text{Ca}^{2+}$  from the sarcoplasm into the sarcoplasmic reticulum is necessary for the contraction of a muscle cell

12. During muscle contraction, which of the following statement is INCORRECT:

- a. The hydrolysis of ATP energises the cross-bridge
- b. Thick filament has a cross-bridge that attaches to a binding site on actin when it is exposed.
- c. Myosin is the molecule with energised cross-bridge which produces muscle cell contraction located
- d. Troponin changes shape on binding with calcium ions and pulls actin away from the binding sites on the tropomyosin molecule

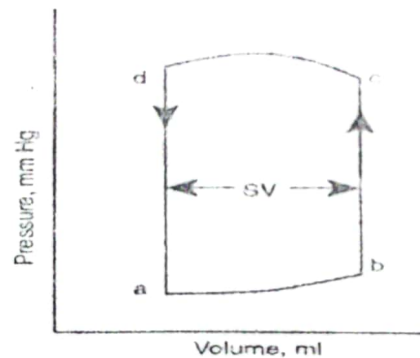
13. With reference to the cardiac cycle, which of the following statement is CORRECT:

- a. The work of the right ventricle is greater than the work of the left ventricle
- b. The first heart sound occurs at the end of the isovolumetric contraction phase
- c. The QRS complex of the ECG immediately precedes the isovolumetric contraction phase
- d. The right ventricle ejects less blood than the left ventricle because its wall is thinner

14. With reference to heart valve functioning, which of the following statement is CORRECT:

- a. The right ventricle receives blood through the mitral valve
- b. Isovolumetric contraction is closely associated to a closed tricuspid, mitral, pulmonary, and aortic valve
- c. Regarding cardiac ejection, the opening of the aortic and pulmonary valves causes the first heart sound
- d. Ventricular filling begins as soon as the aortic valve opens

15. In this classic pressure-volume loop of the left ventricle below, which of the following statement is INCORRECT:



- a. The right-hand vertical line represents isovolumetric relaxation
- b. The top left corner represents aortic valve closure
- c. The bottom right corner represents mitral valve closure
- d. The mitral valve closes at the onset of isovolumetric contraction

16. Regarding the electrical activity of the heart, which of the following statement is INCORRECT:

- a. The sinoatrial node is in the upper interventricular septum
- b. The atrioventricular node delays the transmission of electrical excitation to the ventricles
- c. The atrioventricular node transmits excitation more quickly during sympathetic stimulation
- d. The propagation of electrical excitation across the heart generates the clinical electrocardiogram

17. Regarding the electrical activity of the heart, which of the following statement is CORRECT:

- a. The Purkinje fibres of the heart are nerve fibres that conduct excitation rapidly to the ventricles.
- b. An increase in the activity of cardiac sympathetic fibres increases the heart rate
- c. Increased activity of the parasympathetic fibres to the heart causes tachycardia
- d. The atrioventricular node transmits excitation more quickly during parasympathetic stimulation

18. In the electrocardiogram (ECG) of a healthy human, which statement is FALSE

- a. The P wave is generated by atrial muscle depolarization
- b. The QRS complex is due to ventricular depolarization
- c. Atrial repolarization generates the P wave
- d. Ventricular repolarisation generates the T wave

19. Regarding arterial blood pressure, which statement is CORRECT:

- a. Increased blood osmolarity decreases blood pressure
- b. Vasoconstriction of blood vessels would increase blood pressure
- c. Hypertension occurs when blood volume is too low
- d. An increase in parasympathetic impulses along the vagus nerve causes an increase in blood pressure

20. Mean arterial blood pressure will increase by;

- a. Generalised vasodilation of blood vessels
- b. A severe haemorrhage
- c. Excretion of more water in urine
- d. Tachycardia

**INSTRUCTION:** Questions 21 to 30; Indicate what kind of compensatory changes occur in the given factors to restore blood pressure to normal in response to hypovolemic hypotension resulting from severe hemorrhage: Indicate if the factor will - increase (a) or decrease (b) or remains the same(c)

- a. increases                                      b. decreases                                      c. remains the same

21. Heart rate
22. Arteriolar radius
23. Total peripheral resistance
24. Venous radius
25. Venous return
26. Urinary output
27. Fluid retention within the body
27. Fluid movement from interstitial fluid into plasma across the capillaries
29. Respiratory rate
30. Cardiac contractility

**INSTRUCTION:** Questions 31 – 35; Use the following answer code (a – c) to compare the relative magnitudes of the pair of statements given

- a. Item X is greater than item Y                      b. Item Y is greater than item X  
c. Item X and item Y are approximately equal

31.  
X - Volume of blood in ventricles at the onset of isovolumetric ventricular contraction  
Y - Volume of blood in ventricles at the end of isovolumetric ventricular contraction
32.  
X - Volume of blood in left ventricle at the time aortic valve opens  
Y - Volume of blood in left ventricle at the time aortic valve closes
33.  
X - Duration of refractory period in cardiac muscle  
Y - Duration of contraction in cardiac muscle
34.  
X - Resistance and pressure in pulmonary circulation  
Y - Resistance and pressure in systemic circulation

35.

X - Volume of blood pumped out by left side of heart

Y - Volume of blood pumped out by right side of heart

**INSTRUCTION:** QUESTIONS 36 to 55; Indicate whether each statement is True (a) or False (b). You score +1 for a correct choice and 0 (Zero) for a wrong choice/no choice/an unclear choice.

36. In Starling's mechanism of the heart, the heart is a generous organ such that if it receives less blood volume, it will give out more blood volume
37. End-systolic volume will be reduced when myocardial contractility is increased
38. The slight transmission delay at the sinoatrial node allows the ventricular systole to proceed only after the atrial systole
39. Closure of atrioventricular valve begins the systolic phase of the cardiac cycle and closure of the pulmonary/aortic valves signal the start of diastole
40. Backflow of the pulmonary blood in to the right ventricles is prevented by the closure of the mitral valve
41. During exercise, the venous return is enhanced
42. In hypertension, afterload is elevated, and more cardiac work has to be done to pump to perfuse the peripheral tissues
43. The normal heart rate is spontaneously generated by the pacemaker activity of the atrioventricular nodal cells to produce about 72 beats per minute
44. Adrenaline increases the heart rate and reduces myocardial contractility when one is in an anxious state
45. Isovolumetric relaxation begins just after the T repolarization wave along the ECG
46. The systolic isovolumetric contraction begins just after the QRS deflection and ends when the aortic/pulmonary valves are pressurized open
47. Sympathetic nerve action on the heart increases the ejection fraction and the end-systolic volume
48. Venoconstriction by sympathetic nerve decreases venous return and gives a higher cardiac output
49. Blood viscosity is a factor that contributes to the vascular resistance
50. Edema may be caused by high blood pressure
51. Edema may be caused increased plasma protein concentration in blood
52. The leakage of plasma proteins into the interstitial fluid distorts the balance of fluid volume exchange at the capillary bed
53. Blockage of lymphatic vessels is another cause of edema
54. Urinary output decreases as compensatory change to restore blood pressure to normal in response to hypovolemic hypotension resulting from severe hemorrhage
55. Heart rate increases as compensatory change to restore blood pressure to normal in response to hypovolemic hypotension resulting from severe haemorrhage



## RESPIRATORY PHYSIOLOGY

**INSTRUCTION:** Question 56 – 90; select the most appropriate option that best answers the questions below.

56. External respiration includes all the following except \_\_\_\_\_.
- Usage of oxygen by mitochondria to produce ATP
  - Breathing
  - Gaseous exchange between lungs and blood
  - Transport of gases in blood
57. The respiratory system decreases and increases pressure in the lungs by \_\_\_\_\_.
- By regulating volume of the thoracic cavity
  - By regulating blood pressure
  - By regulating partial pressure of Oxygen
  - By regulating partial pressure of Carbon dioxide
58. Contraction of the diaphragm affects changes in which dimension of volume?
- Lateral dimension
  - Anterior-posterior dimension
  - Vertical dimension
  - None of the above
59. Contraction of the intercostal muscles affect changes in which dimension of volume?
- Lateral dimension
  - Anterior-posterior dimension
  - Vertical dimension
  - None of the above
60. Transfer of gasses from alveoli into the blood in the capillaries is through \_\_\_\_\_.
- Osmosis
  - Facilitated diffusion
  - Simple diffusion
  - Water pores
61. Asthma is characterized by \_\_\_\_\_.
- Constriction of bronchioles
  - Relaxation of bronchioles
  - Constriction of trachea
  - Relaxation of trachea
62. \_\_\_\_\_ are the main sites for gaseous exchange between the lungs and blood.
- Conducting zone / airways
  - Respiratory zone / airways
  - Terminal bronchioles
  - None of the above

63. Which of the following disease(s) below affects the compliance property of the lungs?
- chronic obstructive lung disease
  - asthma
  - pneumonia
  - lung fibrosis
64. The main determinant of gases diffusing across the respiratory membrane is .
- an individual's O<sub>2</sub>-carrying capacity
  - the partial pressure gradient of the diffusing gases
  - the temperature of the individual
  - the levels of 2,3-Bisphosphoglycerate in an individual
65. The arterial partial pressure of oxygen can be increased beyond 100 mmHg by which of the following means?
- use of intranasal prongs for oxygen delivery
  - use of face mask for oxygen delivery
  - use of the hyperbaric chamber
  - breathing of normal atmospheric air
66. All of the below muscles relax during quiet inspiration except \_\_\_\_\_.
- Internal intercostal muscle
  - External intercostal muscle
  - diaphragm
  - Scalene muscles
67. Pneumonia increases which of the below respiratory spaces?
- anatomic dead space
  - physiologic dead space
  - functional dead space
  - both "b" and "c"
68. Which of the following is correct about surfactant?
- surfactant is produced by type I pneumocytes
  - surface tension reduction by surfactant reduction is greatest in smaller alveoli
  - surfactant has little role in the respiratory function in neonates
  - none of the above
69. The normal range for respiratory rate in adult is .....
- 6 to 12 cycles per minute (cpm)
  - 18 to 24 cycles per minute (cpm)
  - 12 to 18 cycles per minute (cpm)
  - 8 to 10 cycles per minute (cpm)

70. which of the following disease(s) below affects the elastic property of the lungs?

- a. emphysema
- b. asthma
- c. pneumonia
- d. both "b" and "c"

71. The volume of air in a dead man's lung is equivalent to \_\_\_\_\_.

- a. 500 milliliters of air
- b. his expiratory reserve volume
- c. his vital capacity
- d. his functional residual capacity

**Note: Use the below case study to answer questions 17 to 22 below.**

Forty-six (46) years old Mr. Akoto was brought to you at the emergency department with a presenting complaint of breathlessness. You immediately instructed the nurse to check the following vital signs from the man:  $S_{PO_2}$ , temperature, blood pressure, pulse rate and respiratory rate (find recorded values of vitals below). On auscultating his lungs, you discovered crackles indicative of pulmonary edema and ordered that the nurse injects Mr. Akoto with intravenous furosemide to dry his chest of the oedema (fluid). His  $S_{PO_2}$  increased from 70% to 75% after administering supplemental oxygen and subsequently to 98% after the administration of intravenous furosemide.

**VITALS:**

$S_{PO_2}$  (initial – on room air) = 70%

$S_{PO_2}$  (after administration of oxygen) = 75%

$S_{PO_2}$  (after IV furosemide & oxygenation) = 98%

Respiratory Rate = 22 cycles per minute

Blood pressure = 110/80 mmHg

Pulse rate = 95 beats per minute

Temperature = 39.8 ° C

72. What will Mr. Akoto's minute ventilation be, if his tidal volume is 250 ml \_\_\_\_.

- a. 600 ml/minute
- b. 1250 ml/minute
- c. 6500 ml/minute
- d. 5500 ml/minute

73. Which of the following may have contributed to his initial low  $S_{pO_2}$ ?
- His high respiratory rate
  - His high Pulse rate
  - His pulmonary oedema
  - None of the above
74. Which of the below investigations will you request if he was still breathless after the increase of his  $S_{pO_2}$  from 70% to 98%?
- Blood glucose level
  - Total body water
  - $SaO_2$
  - Haemoglobin level
75. Which of his vital signs may have reduced the extent to which oxygen bound to his haemoglobin molecules (haemoglobin saturation).
- His blood pressure level
  - His respiratory level
  - His pulsed rate
  - His body temperature
76. If a complete blood count (CBC) you requested revealed a haemoglobin level of 7.6 g/dL, what will be his oxygen binding capacity?
- 7.6 ml  $O_2$ /100ml of blood
  - 15.2 ml  $O_2$ /100ml of blood
  - 10.2 ml  $O_2$ /100ml of blood
  - 20.1 ml  $O_2$ /100ml of blood
77. What amount of oxygen is bound to Mr. Akoto's haemoglobin level of 7.6 g/dL?
- 7.0 ml  $O_2$ /100ml of blood
  - 15.0 ml  $O_2$ /100ml of blood
  - 10.0 ml  $O_2$ /100ml of blood
  - 20.0 ml  $O_2$ /100ml of blood
78. Neural control of involuntary breathing is influenced by all of the below except\_\_\_\_\_.
- Baroreceptors
  - Chemoreceptors
  - Stretch receptors in the lung
  - Afferents from muscle and joint receptors

79. The basic rhythm of ventilation (involuntary breathing) is generated by the pacemaker activity of the \_\_\_\_\_.
- Apneustic center
  - Pre-Botzinger complex
  - Pneumotaxic center
  - Ventral respiratory group (VRG)
80. The primary respiratory control center is the \_\_\_\_\_.
- Pons respiratory center
  - Apneustic center
  - Pneumotaxic center
  - Medullary respiratory center
81. Damage to which of the following respiratory centers results in apneusis?
- Apneustic center
  - Pneumotaxic center
  - Dorsal respiratory group
  - None of the above
82. The magnitude of ventilation is adjusted in response to all of the below chemicals except \_\_\_\_\_.
- $\text{PCO}_2$
  - $\text{PO}_2$
  - $\text{H}^+$
  - $\text{N}_2$
83. Peripheral chemoreceptors stimulate the respiratory center to increase breathing only when  $\text{PO}_2$  falls below \_\_\_\_\_.
- 90 mmHg
  - 80 mmHg
  - 70 mmHg
  - 60 mmHg
84. The brainstem chemoreceptors are exquisitely sensitive to changes in \_\_\_\_\_ of the cerebrospinal fluid (CSF).
- $\text{PCO}_2$
  - $\text{PO}_2$
  - $\text{H}^+$
  - $\text{N}_2$
85. Oxygen delivery to tissues is a function of .....
- cardiac output and arterial oxygen content ( $\text{CaO}_2$ )
  - dissolved oxygen and oxyhaemoglobin
  - total oxygen-binding capacity and percent saturation of haemoglobin
  - both "b" and "c"

Use the table below to answer the following question.

Parameter	Actual values	Predicted values	% Predicted
FVC	3.20 liters	5.0 liters	64
FEV1	2.50 liters	4.00 liters	63
FEV1/FVC	78%	80	98%

FVC – force vital capacity; FEV1 – forced expiratory volume in 1 second

86. The above spirometry results in suggestive of which of the following airway state?

- Obstructed airway
- Restricted airway
- Normal airway
- Inconclusive results

Use the table below to answer the following question (32).

Parameter	Actual values	Predicted values	% Predicted
FVC	4.00 liters	6.00 liters	67
FEV1	2.00 liters	5.00 liters	40
FEV1/FVC	50%	83	60%

FVC – force vital capacity; FEV1 – forced expiratory volume in 1 second

87. The above spirometry results in suggestive of which of the following airway state?

- Obstructed airway
- Restricted airway
- Normal airway
- Inconclusive results

Use the table below to answer the following question (33).

Parameter	Actual values	Predicted values	% Predicted
FVC	5.20	5.50	94
FEV1	4.00	5.00	80
FEV1/FVC	76%	90	84%

FVC – force vital capacity; FEV1 – forced expiratory volume in 1 second

88. The above spirometry results in suggestive of which of the following airway state?

- Obstructed airway
- Restricted airway
- Normal airway
- Inconclusive results

89. Spirometry results are influenced by all of the following except?
- Age
  - Blood pressure
  - Ethnicity
  - Sex
90. In preparation for spirometry, the following are observed except \_\_\_\_\_.
- Avoidance of food for not more than 24 hours
  - Abstinence from alcohol for at least 4 hours prior to test
  - Avoidance of vigorous exercise for at least 30 minutes prior to test
  - Avoidance of smoking for at least an hour before test

### **GASTROINTESTINAL PHYSIOLOGY**

**INSTRUCTION:** Please Select the Most Appropriate Answer.

91. In which parts of gastrointestinal tract are enzymes that digest carbohydrate secreted but are least active?
- Mouth
  - Salivary glands
  - Pancreas
  - Duodenum
92. Which statement regarding amylase present in the human gastrointestinal tract (GIT) is true?
- All amylase are produced by accessory organs
  - The active amylase in the human GIT is the alpha type
  - Activity of amylase is limited to digesting carbohydrates to maltose
  - Amylases work best in acid medium
93. Which activity cannot be considered as one of major functions of the gastrointestinal system (GIS)?
- Hydrochloric acid production
  - Excretion of bile salts
  - Secretion of glucagon
  - Digestion of triglycerides
94. What happens when chyme rich in fat enters the duodenum?
- Enterocytes digest the fat
  - Gastrin secretion is stimulated
  - Histamin secretion is stimulated
  - Cholecystokinin-Pancreozymin secretion is stimulated

95. Which part of the body is noted to influence food intake?
- The brain
  - The muscles
  - The Kidneys
  - All the above
96. Which amount of carbohydrates will yield the most amount of glucose molecules after complete digestion?
- One mole of sucrose
  - One mole of lactose
  - One mole of maltose
  - One mole of galactose
97. What is the primary role of bile in GIT function?
- Enzymatic digestion of fat
  - Providing an alkaline medium for digestion
  - Providing an acidic medium for digestion
  - Breaking up fat globules and enabling lipases to digest them
98. The liver is able to do the following EXCEPT
- Store glucose as glycogen
  - Release glucose from glycogen
  - Make glucose from amino acids
  - Make glucose from fatty acids
99. These types of movement are normal in parts of the gastrointestinal tract (GIT) EXCEPT
- Anti-peristalsis
  - Mass movement
  - Propulsion
  - Segmentation
100. Where are pancreatic pro-enzymes activated? They are activated in the
- bile duct
  - pancreatic acini
  - pancreatic duct
  - duodenum
101. Which constituents of bile promote the mechanical break up of fats in the watery medium of the gut?
- Bicarbonate
  - Bilirubin
  - Bile acids
  - Bile salts



102. In which age group of humans can the GIT absorb some whole proteins that have not been digested?
- Newborns
  - Older infants (6 months to 1 year olds)
  - 5 year to 11 year olds
  - Teenagers
103. Which enzyme works best under high concentrations of  $H^+$ ?
- Ptyalin
  - Renin
  - Pancreatic amylase
  - Carboxypeptidase
104. Which one of the following enzymes does not digest carbohydrates?
- Sucrase
  - Aminopeptidase
  - Maltase
  - Disaccharidase
105. In which area of the GIT is the digestion of proteins completed?
- The Mouth
  - The Esophagus
  - The Small Intestine
  - The Large Intestine
106. Which type of movement occurs in the stomach when the sphincters between the esophagus and stomach, as well as between the pylorus and duodenum, are closed?
- Swallowing
  - Mixing
  - Vomiting
  - Regurgitation
107. What arrangement allows for the conscious control of defecation?
- The sympathetic system inhibition of GIT motility
  - A planned daily routine bowel evacuation
  - The parasympathetic control of the internal anal sphincter
  - The somatic nervous system regulation of the external anal sphincter
108. Constipation is likely to occur in an individual with the stated behaviour EXCEPT
- drinking fresh pasteurised milk when lactose intolerant
  - habitually drinking very little water during the day
  - working in a career that is very time demanding and stressful
  - regularly ignoring the urge to go to defecate

109. Endocrine cells of the Duodenum make and release .....

- a. Insulin
- b. Cholecystokin pancreozymin (CCK-PZ)
- c. Gastrin
- d. Estrogen

110. What helps to protect the stomach wall from damage by gastric acid?

- a. Mucus secreted by stomach epithelium
- b. Bicarbonate secreted by the pancreas
- c. Gastrin made by stomach
- d. A factor not known

111. In which area of GIT is SECRETION not a major function?

- a. The mouth
- b. The esophagus
- c. The stomach
- d. The duodenum

112. Which statement about the gastrointestinal tract (GIT) is CORRECT?

- a. The GIS is a sterile environment in the regions of the ileum and caecum
- b. The remnants of digested food are finally absorbed in the ascending colon
- c. Electrolytes are only absorbed and not secreted in the large intestine
- d. The longer faecal matter remains in the sigmoid colon the less water it contains

113. Select the statement or combination that is valid regarding the control of the functions of the accessory organs of the GIT and results observed.

- a. The failure of a hypothalamic region of the brain may result in continual eating by an individual who is already obese
- b. The failure of a hypothalamic region of the brain may result in self starvation by an individual who is underweight
- c. The adequate intake of vitamins is essential for the normal control of food intake
- d. All the statements are valid

**INSTRUCTION: Questions 114 to 120.** Please for each Statement Select A. TRUE for a true statement or B. FALSE for a false statement. You score +1 for a correct choice and 0 (Zero) for a wrong choice/no choice/an unclear choice.

114. Mastication of food does not play any important role in the digestion of protein part of the food eaten.

- a. TRUE
- b. FALSE

115. Food must be physically present in the stomach before the Secretion of HCl is activated
- TRUE
  - FALSE
116. The post-absorptive phase of GI function is the period following absorption of digested food in the small intestine
- TRUE
  - FALSE
117. Absorption of monosaccharides and amino acids both stimulate insulin release from the pancreas
- TRUE
  - FALSE
118. The sympathetic nervous system stimulates the release of glucose from stored glycogen during a period of fasting
- TRUE
  - FALSE
119. Some types of fatty acids called essential fatty acids cannot be made in humans and must be present in the diet
- TRUE
  - FALSE
120. Human beings can survive longer with the lack of food than with a lack of water.
- TRUE
  - FALSE

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- TRUE
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- TRUE
  - FALSE