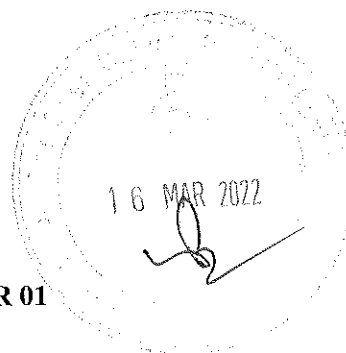


THE OPEN UNIVERSITY OF SRI LANKA
FACULTY OF HEALTH SCIENCES
DEPARTMENT OF BASIC SCIENCES
ACADEMIC YEAR 2020/2021 – SEMESTER 01
BACHELOR OF PHARMACY HONOURS



BSU3431 – HUMAN PHYSIOLOGY – LEVEL 03
FINAL EXAMINATION
DURATION: THREE HOURS

THREE HOURS

DATE:16.03.2022

TIME:9.30 am to 12.30 pm

INDEX NO:

IMPORTANT INSTRUCTIONS / INFORMATION TO CANDIDATES

- This question paper consists of 11 pages with three Parts / Sections:
 - **Part A / Section 1: Multiple Choice Questions - MCQs (30 marks):** There are 30 MCQs. Indicate answers for all questions in the answer sheet provided by placing a cross (x) in ink in the relevant cage (answers in pencil will not be marked).
 - **Part B / Section 2: 04 Structured Essay Questions - SEQs (40 marks):** There are 04 SAQs. Write answers for all questions within the space provided in the question paper.
 - **Part C / Section 3: Essay Questions (30 marks):** There are 02 essay questions. Write answers for questions in the answer books provided.
- Answer ALL questions.
- Write your **Index Number** in the space provided.
- Do NOT bring in on person or have in possession unauthorized materials, including mobile phones and other electronic devices, or violate any other examination rules.
- Do NOT remove any page/part of this question paper from the examination hall.

INDEX NO:

Part A – MULTIPLE CHOICE QUESTIONS*(30 marks)*

Choose the most suitable / best answer and indicate with a 'X' in the answer sheet provided.

1. Choose the **correct** statement about the cell membrane?
 - a. It is made of phospholipid bilayer.
 - b. Proteins are always arranged on the outer surface of the cell membrane
 - c. Protein molecules participate in cell communication
 - d. Lipid soluble molecules pass through the membrane by facilitated Diffusion

2. The air sacs of the lungs are lined by
 - a. stratified squamous epithelium
 - b. simple columnar epithelium
 - c. simple squamous epithelium
 - d. pseudostratified columnar epithelium

3. Microvilli
 - a. increase the surface area of the cell
 - b. facilitate the absorption of ingested food
 - c. is found only in the gastrointestinal tract
 - d. are finger like membrane projections

4. Which one of the following is a mode of **active transport**?
 - a. Facilitated diffusion
 - b. Simple diffusion
 - c. Osmosis
 - d. Endocytosis and Exocytosis

5. Motor units
 - a. are the smallest functional unit of the motor system
 - b. consist of motor neurone and all the muscle fibers it innervates
 - c. consist of varying number of skeletal muscle fibers
 - d. All the above are correct

6. The oxytocin hormone is **produced** by
 - a. Anterior Pituitary
 - b. Hypothalamus
 - c. Posterior pituitary
 - d. Thyroid gland

7. The hormone which affects the blood calcium level
 - a. Parathyroid hormone
 - b. ADH
 - c. Cortisol
 - d. Adrenaline

8. The amount of blood the heart pumps each minute is referred as
 - a. Cardiac cycle
 - b. Cardiac output
 - c. Stroke volume
 - d. Heart rate

9. Which of the following is an **incorrect** statement regarding blood groups?
 - a. Agglutinogens are lipids
 - b. Agglutinogens are present in the surface of the red blood cells
 - c. If blood type AB, both agglutinogens A and B are present
 - d. In blood type O, there are no agglutinogens on the surface of the red blood cells

10. Gastrin hormone is **not secreted** when
 - a. food is present in the stomach
 - b. there is a rise in the pH of the stomach contents
 - c. receive signals from the parasympathetic nervous system
 - d. the pH of the stomach contents reduces

11. Which one of the following statements is **incorrect** regarding ovarian cycle?
 - a. Series of changes in the ovary during which the follicle matures, the ovum is shed, and the corpus luteum develops
 - b. Luteinizing hormone (LH) stimulate ovulation
 - c. Ovulation is the phase in which a mature ovarian follicle ruptures and discharges an ovum
 - d. Follicular stimulating hormone (FSH) levels rise sharply after ovulation

12. Select the **false** statement regarding cardiac muscle cells
 - a. They are branched
 - b. They contain only one nucleus located in the periphery
 - c. They contain intercalated discs
 - d. They have gap junctions

13. In a parasitic infection, which of the following type of leucocytes is elevated?
 - a. Neutrophils
 - b. Eosinophils
 - c. Basophils
 - d. Monocytes

14. The correct order of immunoglobulins elevated levels during an incompatible blood transfusion, in breast milk and in intrauterine life is
- IgG IgM, IgA,
 - IgA, IgG, IgM
 - IgM, IgA, IgG
 - IgM, IgG, IgA
15. The function of bile is to facilitate the digestion of
- Proteins
 - Minerals
 - Fats
 - Starch
16. Digestion of starch begins in the
- Stomach
 - Mouth
 - Small intestine
 - Oesophagus
17. If the patient's blood pressure is 120/90mmHg, the **pulse pressure** is
- 120mmHg
 - 90mmHg
 - 30mmHg
 - 100mmHg
18. Arterial blood pressure (MAP)
- Is calculated using diastolic pressure and pulse pressure
 - it measures the pressure necessary for adequate perfusion of the organs of the body
 - is regulated by changes in cardiac output
 - all the above is true
19. The **average stroke volume** of a normal adult **at rest** is
- 20mL per beat
 - 70mL per beat
 - 20mL
 - 200mL
20. Which of the following is true regarding the normal blood volume in an individual?
- It doesn't depend on body size and weight
 - average human adult has nearly 7 L of circulating blood
 - Women tend to have a higher blood volume than men
 - During pregnancy total blood volume increases
21. Select the correctly matched increased hormone secretion and the disorder,
- Parathyroid hormone- Dwarfism

- b. Antidiuretic hormone- Diabetes mellitus
- c. Glucocorticoids –Cushing syndrome
- d. Glucagon- Diabetes insipidus

22. Following is the largest white blood cell in the human

- a. eosinophil
- b. monocyte
- c. B cells
- d. neutrophils

23. Following substance is **not** filtered into the Bowman's capsule

- a. urea
- b. red blood cells
- c. sodium ions
- d. glucose

24. The volume of air passing into and out of the lungs during each cycle of breathing is known as

- a. expiratory reserve volume
- b. tidal volume
- c. inspiratory reserve volume
- d. residual volume

25. Select the correctly matched pair

Hormone	Function
a. Parathyroid hormone	reduces blood Ca^{2+}
b. Oxytocin	stimulates ejection of breast milk
c. Insulin	increases blood glucose levels
d. Erythropoietin	stimulate B cell production

26. The hypothalamus influences the secretions of the anterior pituitary gland by

- a. communicating indirectly with arterial blood from a capillary network in the hypothalamus
- b. releasing and inhibiting hormones secreted by the hypothalamo-hypophyseal tract
- c. communicating with nerve cells downwards from the hypothalamic nuclei
- d. transporting the hormones along the axons and storing in vesicles within the axon terminals to be released

27. Which one of the following statements is **false** regarding hormones?
- Hormones must bind to specific receptors to produce their specific effects
 - They are chemical messengers
 - Hormones are released via ducts and are transported throughout the body
 - They act in a site away from the point of secretion
28. Basal metabolic rate (BMR) is regulated by
- oxytocin
 - thyroxin
 - progesterone
 - parathyroid hormone
29. The superior oblique muscle of the eye is supplied by
- trochlear Nerve
 - oculomotor nerve
 - trigeminal nerve
 - abducent Nerve
30. Select the **correct** statement regarding the common defects of the image forming mechanism of the human eye
- In hyperopia, parallel light rays diverge slightly before they strike the eye
 - The hyperopia can be corrected by using glasses with biconcave lenses
 - In Myopia, the light rays focus behind the retina
 - Presbyopia is mostly due to the hardening of the lens in old age

INDEX NO:

Part B – STRUCTURED ESSAY QUESTIONS

(40 marks)

Write answers in the space provided.

1. A) **Draw and name** the layers of the 'Respiratory membrane'. (6 marks)

B) What is surfactant and state the importance of it in the lungs? (4 marks)

.....
.....
.....
.....
.....

2. A) List **four (04)** changes that occur during aging in the digestive system (4 marks)

.....
.....
.....
.....
.....

B) Explain the basis of respiratory distress syndrome in a new-born baby. (6 marks)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

3. List the **one (01) major function** of following organelles. (10 marks)

a) Ribosomes

.....

.....

b) ER

.....

.....

c) Golgi apparatus

.....

.....

d) Mitochondria

.....

.....

e) Nucleus

.....

.....

4. Define the followings

i. Blood pressure (2 marks)

.....
.....

ii. Systolic blood pressure (2 marks)

.....
.....

iii. Diastolic blood pressure (2 marks)

.....
.....

iv. Pulse pressure (2 marks)

.....
.....

v. Mean Arterial Pressure (MAP) (2 marks)

.....
.....

INDEX NO:

Part C – ESSAY QUESTIONS*(30 marks)*

1.
 - i. What is a motor unit (2 marks)
 - ii. Explain the structure of a typical neuromuscular junction (7 marks)
 - iii. Name hormones secreted by the adrenal cortex and one function for each of the hormones (6 marks)

2.
 - i. List **three (03)** functions of the human liver (3 marks)
 - ii. State **two (02)** common disorders in the liver and mention their causes (4 marks)
 - iii. Describe the adaptations in the small intestine for absorption of nutrients (8 marks)



1