

**BINDURA UNIVERSITY OF SCIENCE EDUCATION**

**FACULTY OF SCIENCE AND ENGINEERING**

**DEPARTMENT: HEALTH SCIENCES**

**BACHELOR OF SCIENCE HONORS IN NURSING SCIENCES (NURSING EDUCATION)**

**NS 103 (1): HUMAN PHYSIOLOGY I**

**DURATION: 3 HOURS**

**TOTAL MARKS: 100**

Registration number								
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**INSTRUCTIONS TO CANDIDATES**

Answer all questions

NOV 2021

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).

Regarding the human cell;

- a) The cytosol makes up 40% of the total cell volume. (T) (F).
- b) Ribosomes contain protein and RNA (T) (F).
- c) The membrane proteins function as structural/architectural components (T) (F).
- d) Mitochondria synthesize adenosine triphosphate (T) (F).
- e) The fluidity of the cell membrane is increased indirect proportion of cholesterol content (T) (F).

2. Indicate whether the following statements are true or false.

Concerning excitable cells;

- a) They have no resting membrane potential. (T) (F)
- b) They have a high intracellular sodium concentration. (T) (F)
- c) They are impermeable to all ions at rest. (T) (F)
- d) They are activated by hyperpolarization. (T) (F)
- e) They have a high intracellular calcium content. (T) (F)

3. Indicate whether the following statements are true or false.

In the sympathetic nervous system;

- a) The post ganglionic fibres are relatively long. (T) (F)
- b) The fibres leave the spinal cord in the cervical and thoracic segment of the spinal cord. (T) (F)
- c) The preganglionic transmitter is noradrenaline (T) (F)
- d) The preganglionic receptor is muscarinic (T) (F)
- e) It opposes the flight, fright and fight response of the body. (T) (F)

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

Concerning the parasympathetic nervous system.

- a) The post ganglionic fibres are relatively long. (T) (F)
- b) The fibres leave the spinal cord in the cervical and thoracic segment of the spinal cord. (T) (F)
- c) The postganglionic transmitter acts on nicotinic receptors. (T) (F)
- d) The postganglionic receptor is muscarinic. (T) (F)
- e) It is under voluntary control. (T) (F)

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

Agents that stimulate platelet adhesion or aggregation include,

- a) Collagen (T) (F)
- b) Prostacyclin (T) (F)
- c) Aspirin (T) (F)
- d) Thromboxane A<sub>2</sub> (T) (F)
- e) Vonwill brand factor (T) (F)

6. **The following are characteristics of the plasma membrane**

- a) Flexible lipid bilayer (T) (F)
- b) Separates cytosol from extracellular matrix (T) (F)
- c) Synthesizes secretory vesicles for exocytosis (T) (F)
- d) Made up of only phospholipids to act as a protective barrier against outside substances (T) (F)
- e) Glycoproteins embedded in the bilayer membrane (T) (F)

7. **Indicate whether the following statement is true or false**

- a) The human cell membrane allows all substances to enter and leave the cell through its pores (T) (F)
- b) The symport is a type of passive secondary transport (T) (F)
- c) The body is made up of nervous, muscle and epithelial tissue only (T) (F)
- d) The rRNA is the genetic code of the genes (T) (F)

e) The cytoskeleton is made up of the branches of the cell membrane (T)(F)

**8. Indicate whether the following statement is true or false**

- a) Phospholipids are arranged in a single layer in the cell membrane (T) (F)
- b) Phospholipids are arranged in a double layer in the cell membrane (T) (F)
- c) The cell membrane allows for movement of some substances in and out of the cell (T) (F)
- d) Sodium-Potassium pump is one to the passive transport mechanisms (T) (F)
- e) Glycoproteins are for cell recognition (T) (F)

**9. Indicate whether the following statements are true or false**

- a) Integral proteins are few in number and associated with Glycocalyx (T) (F)
- b) Integral proteins are the most common proteins on the surface of the cell membrane and act as receptors. (T) (F)
- c) Integral proteins maybe embedded in a part of the lipid bilayer or pass all the way through it (T) (F)
- d) Monofilaments are part of the those structures that allow muscle contraction (T) (F)
- e) Smooth and skeletal muscles are the only notable muscles of the body. (T) (F)

**10. Which of the following are functions or features of the nucleus?**

- a) It's nuclear envelope is continuous with the lumen of the Smooth Endoplasmic Reticulum (T) (F)
- b) directs the cell's functions for protein synthesis (T) (F)
- c) produces ribosomes made of mRNA that are embedded along the lumen of the rough ER (T) (F)
- d) contains chromosomes and chromatin composed of histone proteins and deoxyribonucleic acid (T) (F)
- e) The nucleolus is the site for the ribosomes synthesis (T) (F)

**Section B: Carries 50 marks**

Answer all the questions.

- 1. a) Draw and label a diagram of the human cell. (5marks)
- b) Describe the following cell organelles and their functions.
  - i. Mitochondria (6 marks)
  - ii. Nucleus (6 marks)
  - iii. Cell membrane (8 marks)

2. Describe the following:

- a) The control of gastric secretion.
- b) Homeostasis.

(10 marks)

(15 marks)

END OF PAPER