(University of Choice)

MASINDEMULIROUNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUS

UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR

FIRST YEAR, FIRST TRIMESTER EXAMINATION

FOR THE DEGREE
OF
BACHELOR OF SCIENCE IN CLINICAL MEDICINE/HEALTH PROFESSION EDUCATION AND BSC.PHYSIOTHERAPY

COURSE CODE: HCP 101/NUR105/HPT111

COURSE TITLE: MEDICAL PHYSIOLOGY 1

DATE: Wednesday 12th January 2022 **TIME:** 8:00-11:00 Am

INSTRUCTIONS TO CANDIDATES

Section A: Multiple choice questions 20 marks
Section B: Short Answer Questions 40 marks
Sections C: Long Answer Questions 40 marks

TIME: 3 Hours

MMUST observes ZERO tolerance to examination cheating

Section A: Multiple choice questions **20 marks**

1. Erythropoietin:
   a) Is produced by kidney cells only.
   b) Can shorten the cell cycle during the multiplicative stage of erythropoiesis.
   c) Production in response to hypoxia reaches its peak within 24 hours.
   d) Production can be stimulated by some prostaglandins.
   e) Is not essential for erythropoiesis.
2. Facilitated diffusion and active transport:
   a) Both require ATP.
   b) Both depend on the solubility of the compound in lipid.
   c) Both require the use of proteins as carriers.
   d) Both carry solutes in only one direction.
   e) Both carry solutes in two directions.
3. The largest organelle in the cell is:
   a) The endoplasmic reticulum.
   b) The nucleus.
   c) Te golgi complex.
   d) The mitochondria.
   e) The cell membrane.
4. In protein synthesis:
   a) A DNA molecule unwinds and unzips along its bases ready for copying.
   b) A transfer RNA forms by copying one side of the DNA.
   c) The transfer RNA leaves the nucleus and goes out to the ribosomes in the cytoplasm where proteins are assembled with the help of messenger RNA.
   d) The messengers RNA leave the nucleus and goes to the cytoplasm where proteins are assembles.
   e) The ribosomal RNA copies the DNA and then goes out to the cytoplasm, where with the help of transfer RNA assembles proteins.
5. Cytokinesis begin in:
   a) Interphase.
   b) Metaphase.
   c) Telophase.
   d) Prophase.
   e) Anaphase.
6. In a smooth muscle:
   a) An action potential is not required for contraction.
   b) Spontaneous pacemaker potentials are generated.
   c) An action potential is required for contraction.
   d) Ca^{2+} is release from sacoplasmic reliculum.
   e) Multiple spiking action potentials occur with increased membrane potentials.
7. DNA replicates through a process called:

a) Dispersive replication.
b) Semi-dispersive replication.
c) Conservative replication.
d) Semi-conservative replication.
e) Non-dispersive replication.

8. Smooth endoplasmic reticulum:
a) Secretes proteins manufactured by ribosomes.
b) Synthesises phospholipids.
c) Inactivates and detoxifies chemicals.
d) Provides communication with the cytoplasm.
e) Packs synthesized lipids and proteins into secretory vesicles.

9. Primary and secondary active transport both:
a) Do not generate ATP.
b) Are not based on passive diffusion of Na+
c) Use ATP directly.
d) Can move solutes against their concentration gradient.
e) Move solutes in two directions.

10. The part of the cell that is most important in maintaining homeostasis within the cell environment is the:
a) Cytoplasm.
b) DNA.
c) Cell membrane.
d) Nucleus.
e) Golgi complex.

11. At a neuromuscular junction:
a) A neurotransmitter causes calcium to be released into the muscle cell.
b) A nerve impulse causes the release of a neurotransmitter.
c) A nerve impulse causes the release of calcium which return causes the release of neurotransmitter.
d) Neurotransmitters do not cause calcium to be released into the muscle.
e) Stimulation of the nerve causes the release of neurotransmitters.

12. A typical event associated with cell signaling involves:
a) Activation of G proteins.
b) Production of second messengers cAMP and IP3.
c) Activation of protein kinases.
d) Release of calcium ions from the cell membranes.
e) Stimulation of apoptosis

13. Which of the following is shared characteristics by simple diffusion and facilitated diffusion of glucose
a) Occurs down electrochemical gradient.
b) Is saturable
c) requires metabolic energy
d) is inhibited by galactose.
e) Requires Na gradient

14. The diffusion of H2O across a semi permeable or selectively permeable membrane is termed
    a) Active transport
    b) Diffusion
    c) Osmosis
    d) Endocytosis
16. Oxygen enters a cell via?

    a) Diffusion
    b) Filtration
    c) Osmosis
    d) Active transport
17. Which of the following requires energy?

    a) Diffusion
    b) Osmosis
    c) Active transport
    d) Facilitated diffusion
18. Protein synthesis occurs at the

a) Mitochondria Lysosomes
b) Within the nucleus
c) Ribosomes
19. Which of the following is not found in the cell membrane?

a) Cholesterol
b) Phospholipids
c) Proteins
d) Nucleic acids

20. Match the following organelles with their function:

Mitochondria	A. Movement of the cell
Vacuoles	B. Lipid synthesis and transport
Cilia	C. "Powerhouse" of the cell, makes ATP
Smooth ER	D. Storage areas, mainly found in plant cells
Golgi apparatus	E. Packages and distributes cellular products

Section B: Short Answer Questions **40 Marks**

1. Differentiate between mitosis and meosis (5marks)
2. Outline the pathophysiology of mythenia gravis **(5marks)**
3. Elaborate on the excitation contraction coupling mechanism in skeletal muscles **(8 marks).**
4. Explain the steps in haemostasis and blood clotting mechanism **(8 marks).**
5. With the help of a diagram elaborate on synaptic transmission at the neuromuscular junction (8 marks).
6. List 6 cell organelles and its function **(6marks)**

Sections C: Long Answer Questions **40 marks**

1. Discuss the process of protein synthesis **(20 marks)**

2. Discuss with examples secondary active transport mechanisms **(20 marks)**