NAME_____ ID_____TG_____

LUSAKA APEX
MEDICAL UNIVERSITY

FACULTY OF PRE-MEDICAL SCIENCES

CELLS AND BIOMOLECULES
BS 1001
TEST ONE

Wednesday 26TH February 2020

DURATION: 1hr 30mins *TOTAL MARKS: 100*

Examiner: Ms. K Malisa & Mr K. Likando

INSTRUCTIONS FOR THE WHOLE PAPER

1. Write your Student Identity Number on all pages of the answer booklet(s).
2. Answer ALL the questions in this paper in the space provided.
3. Present your work in a clear and logical manner.
4. Any disregard for rules and regulations will result in you being disqualified from this test.
5. Ensure that you sign in attendance register before leaving the room

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SECTION A : MULTIPLE CHOICE QUESTIONS (30 MARKS)

INSTRUCTION: **CIRCLE** THE LETTER WITH THE ANSWER OF YOUR CHOICE

1. To enter or leave a cell, substances must pass through

A. microtubule.

B. the Golgi apparatus.

C. the nucleus.

D. the plasma membrane.

2. Bacterial cells are prokaryotic. In comparison to typical eukaryotic cells they would

A. be smaller.

B. have a smaller nucleus.

C. lack a plasma membrane.

D. have fewer internal membranous compartments.

3. Plant cells are stained and then viewed through a light microscope. Which structures would be clearly visible at a magnification of ×400?

A chloroplast grana

B lysosomes

C nucleus

D ribosomes

4. You would expect a cell with an extensive Golgi apparatus to

A. make a lot of ATP.

B. secrete a lot of material.

C. move actively.

D. perform photosynthesis.

5. Which of the following correctly matches an organelle with its function?

A. mitochondrion . . . photosynthesis

B. nucleus . . . cellular respiration

C. ribosome . . . manufacture of lipids

D. central vacuole . . . storage

6. Mitochondria and chloroplasts share several common features, for example,

A. both are capable of semi autonomous growth and reproduction.

B. neither are components of the endomembrane system.

C. each contains a small amount of DNA

D. all of the above

7. Which group is involved in manufacturing substances needed by the cell?

A. lysosome, vacuole, ribosome

B. ribosome, rough ER, smooth ER

C. vacuole, rough ER, smooth ER

D. smooth ER, ribosome, vacuole

8. A cell has mitochondria, ribosomes, smooth and rough ER, and other parts. Based on this information, it could not be

A. a cell from a pine tree.

B. a grasshopper cell.

C. a yeast (fungus) cell.

D. a bacterium.

9. Dye injected into a plant cell might be able to enter an adjacent cell through the

A. Nucleus

B. Microtubule

C. Plasmodesmata.

D. Rough endoplasmic reticulum

10. A researcher made an interesting observation about a protein made by the rough ER and eventually used to build a cell's plasma membrane. The protein in the membrane was actually slightly different from the protein made in the ER. The protein was probably changed in the…

A. Golgi apparatus.

B. smooth ER.

C. mitochondrion.

D. nucleus.

11. The electron microscope has been particularly useful in studying bacteria, because

A. electrons can penetrate tough bacterial cell walls.

B. bacteria are so small.

C. with few organelles present, bacteria are distinguished by differences in individual macromolecules.

D. their organelles are small and tightly packed together

12. The cell theory is one of the unifying themes of biology. Which of the following statements would be part of the cell theory?

A. All life is made of cells.

B. Cells are the smallest units of life.

C. Cells come from pre-existing cells.

D. All of the above E. none of the above

13. Which of the following clues would tell you whether a cell is prokaryotic or eukaryotic?

A. the presence or absence of a rigid cell wall

B. presence of membrane bound organelles

C. the presence of inclusions

D. whether or not the cell carries out cellular metabolism

14. Which of the following sequences represents the hierarchy of biological organization from the most complex to the least complex level?

A. organelle, tissue, organ, organism
B. organism, organ, tissue, organelle
C. organism, organelle, organ, tissue
D. organism, organ, tissue, organelle

15. A plant cell was grown in a test tube containing radioactive nucleotides, the parts from which DNA is built. Later examination of the cell showed the radioactivity to be concentrated in the…..

A. rough ER.
B. chloroplast
C. smooth ER.
D. central vacuole.

16. A light microscope is used to observe two structures that are 200nm apart. How far apart are the structures when the magnification is changed from ×40 to ×400?

A. 2µm
B. 20µm
C 200nm
D 2000nm

17. An actively growing cell is supplied with radioactive amino acids. Which cell component would first show an increase in radioactivity?

A. Golgi body
B. mitochondrion
C. nucleus
D. rough endoplasmic reticulum

18. Which pair of organelles has internal membranes?

A. Chloroplasts and mitochondria

B. Chloroplasts and nuclei

C. Mitochondria and ribosomes

D. Nuclei and ribosomes

19. Which combination is found in prokaryotic cells?

A. Endoplasmic reticulum and DNA

B. Endoplasmic reticulum and nucleus

C. DNA and RNA

D. RNA and Nucleus

20. What is the function of the nucleoli?

A. The formation and break down of the nuclear envelope.

B. Formation of a centromere

C. Formation of ribosomes

D. Organization of the spindle during cell division

21. What is the order of size of cell components from the largest to the smallest?

A mitochondria, ribosomes, starch grains, nuclei

B nuclei, chloroplasts, mitochondria, ribosomes

C ribosomes, mitochondria, chloroplasts, starch grains

D starch grains, mitochondria, chloroplasts, ribosomes.

22. Which structures are surrounded by double membranes?

A. Mitochondrion and Nucleus

B. Golgi apparatus

C. Lysosomes and cytoplasm

D. All of the above

23. In which animal cells would Golgi apparatus be most abundant?

A. ciliated epithelial cells

B. goblet cells

C. red blood cells

D. smooth muscle cells

24. Which is a feature of all prokaryotic cells?

A. absence of cell surface membrane

B. division by mitosis

C. presence of mitochondria

D. presence of ribosomes

25. Which structure is present in cells of eukaryotes but not present in cells of prokaryotes?

A. 70s ribosome

B. chromatin

C. mesosome

D. plasmid

26. Cells which do not have nucleoli die because they do not have

A. centrioles and cannot divide.

B. mitochondria and cannot release energy.

C. mRNA and cannot transcribe DNA.

D. ribosomes and cannot synthesise protein.

27. Which observation suggests that a cell is eukaryotic?

A. Presence of endoplasmic reticulum

B. Protein molecules are associated with DNA

C. Ribosomes distributed through the cytoplasm

D. All of the above.

28. A cell organelle that detoxifies about half the alcohol a person drinks is
    A. Liver
    B. Lysosome
    C. Peroxisome
    D. Secretory vesicle
    E. Peptidoglycan

29. The interval between mitosis is called
    A. Interphase
    B. M-phase
    C. Karyokinesis
    D. Both (a) and (b) above are correct

30. The first microscope was invented by
    A. Aristotle
    B. Matthias Schleiden
    C. Theodor Schwann
    D. Anton Von Leeuwenhoek

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SECTION B: SHORT ANSWER QUESTIONS (70 MARKS)

B1. State and explain the modern cell theories. [10 Marks]

B2. What is spontaneous generation? How was this theory disproved by Francesco Redi in 1968? You may use an illustration. [10 Marks]

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B3. Complete the following table on early systems of classification. [10 Marks]

NAME OF TAXONOMIST	**CONTRIBUTION**
	Classified plants into herbs, plants and trees.
John Ray	
	First to classify organisms into plants and animals.
	Published the book Systema Naturae in 1758
Aristotle	

B4. (a) Define binomial nomenclature? Use your knowledge to apply how binomial nomenclature is used to name a human being. [3 Marks]

(b) List the 7 mandatory taxonomic ranks of naming organisms in descending order.

[7 Marks]

B5. Complete the following table on the similarities and differences between Eukaryotic cells and Prokaryotic cells by using the words "present or absent". [21 marks]

		PROKARYOTIC CELLS	EUKARYOTIC CELLS	
	Characteristic		Plant cell	Animal cell
1.	Plasmids			
2.	Plasma Membrane			
3.	Nucleus			
4.	Ribosomes			
5.	Endoplasmic reticulum			
6.	Mitochondria			
7.	Cytoskeleton			

B6. Draw a well labeled diagram of the cell cycle. [5 Marks]

B7. Describe the stages of mitosis in Eukaryotic cells. [14 Marks]