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UNIVERSITY EXAMINATIONS 2023/2024

FIRST YEAR, FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN CLINICAL MEDICINE AND COMMUNITY HEALTH AND DEVELOPMENT

CCM 3111: CELL BIOLOGY AND GENETICS

DATE: JANUARY 2024

TIME: 3 HOURS

INSTRUCTIONS: *Answer all questions in the booklet provided*

Ensure that all your answers are properly numbered

Section A: Multiple Choice Questions (MCQs)

Section B: Short Answer Questions

Section C: : Long Answer Questions (Answer Only Two Questions)

SECTION A: MULTIPLE CHOICE QUESTIONS (MCQS)

1. Who was the first person to see cells under the microscope and give them a name?
 - a) Anton van Leeuwenhoek
 - b) Robert Hooke
 - c) Theodor Schwann
 - d) Matthias Schleiden
2. Which of the following is NOT one of the main components of the cell theory?
 - a) Cells must contain DNA
 - b) All living things are made of cells



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- c) Cells can only come from other cells
- d) Cells are the basic unit of life

3. This structure serves as the outer boundary of the eukaryotic cell:

- a) Flagella
- b) Cytoskeleton
- c) cell membrane
- d) capsule

4. The word cyto means:

- a) Cell
- b) Dark
- c) Jelly
- d) Small

5. Tiny structures that carry out cell functions are collectively called:

- a) Animalcules
- b) Organelles
- c) Tissues
- d) Ribosomes

6. What part of a cell is responsible for breaking down and digesting things?

- a) Ribosomes
- b) Lysosomes
- c) endoplasmic reticulum
- d) vacuole

7. The jellylike interior of the cell is called the:

- a) Vacuole
- b) Cytoplasm
- c) Cytoskeleton
- d) Nucleus

8. What part of the cell makes proteins?

- a) Ribosomes
- b) Mitochondria



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- c) Lysosomes
- d) Vacuole

9. What are cells called if they are adapted to perform a certain job?

- a) Specific
- b) Functional
- c) Unique
- d) Specialised

10. What are cells produced by mitosis called?

- a) Sister cells
- b) Daughter cells
- c) Haploid cells
- d) Zygotes

11. A cell that has half the usual number of chromosomes is called what?

- a) Haploid
- b) Diploid
- c) Homozygous
- d) Heterozygous

12. What is the term for when a cell divides?

- a) Cytolysis
- b) Cytocrenation
- c) Cytodivision
- d) Cytokinesis

13. Small circular pieces of DNA in a bacterial cell are called:

- a) Plasmids
- b) Loose DNA
- c) Ribosomes
- d) Enzymes

14. How many sex chromosomes are present in a human being?

- a) 1 pair
- b) 2 pairs



c) 3 pairs
d) 4 pairs

15. Which 4 bases are present in DNA?

- a) AUCG
- b) ATDG
- c) ATCG
- d) ACGD

16. How many restriction sites are contained by a plasmid?

- a) 1
- b) 2
- c) 3
- d) More than 1

17. Which of the following is NOT true about transposable elements?

- a) Transposable elements are primarily considered non-coding DNA
- b) Transposable elements often move around the genome
- c) Transposable elements can cause disease
- d) Transposable elements are only found in eukaryote

18. Which of these could increase the rate of mutation in DNA?

- a) A balanced diet
- b) Ionising radiation
- c) Regular exercise
- d) sickness

19. Most of the genetic disorders are caused due to by:

- a) Mutation
- b) The gender of an individual
- c) The gross chromosomal abnormalities
- d) All of the above

20. Which of the following is called the sex-linked disease?

- a) Leukemia
- b) Alzheimer's



- c) Malignancy
- d) Colour blindness

SECTION B: SHORT ANSWER QUESTIONS (40 MARKS)

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|------------------------------------------------------------|-----------|
| 1. What does the cell theory state | (3 Marks) |
| 2. How do viruses violate the cell theory | (2 Marks) |
| 3. Describe 3 main functions of cell division | (3 Marks) |
| 4. Explain the importance of cell differentiation | (8 Marks) |
| 5. Describe 2 forms of nonrandom mating | (6 Marks) |
| 6. Explain 4 different types of genetic disorders | (8 Marks) |
| 7. Describe any 5 ethical issues surrounding gene therapy. | (5 Marks) |
| 8. Name 3 advantages and 2 disadvantages of gene therapy | (5 Marks) |

SECTION C: LONG ANSWER QUESTIONS (40 MARKS)

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|------------------------------------------------------------------------------|------------|
| 1. Highlight the differences between unicellular and multicellular organisms | (16 Marks) |
| i. Give two examples of multicellular organisms | (2 Marks) |
| ii. Give two examples of unicellular organisms | (2 Marks) |
| 2. Describe the cell cycle including the stages of mitosis. | (20 Marks) |
| 3. With examples Discuss any 5 chromosomal genetic disorders | (20 Marks) |



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