CRAWFORD UNIVERSITY

FAITH CITY, IGBESA, OGUN STATE

2022/2023 HARMATTAN SEMESTER RESCHEDULED EXAMINATIONS

COLLEGE: NATURAL AND APPLIED SCIENCES

DEPARTMENT: BIOLOGICAL SCIENCES

PROGRAMME: BIOCHEMISTRY

COURSE CODE: BCH 213

COURSE TITLE: INTRODUCTION TO CELLULAR BIOCHEMISTRY

TIME ALLOWED: 2 HOURS **UNIT:** 2

STATUS: COMPULSORY

INSTRUCTION: DO ALL THE QUESTIONS IN PART A AND TWO (2) IN PART B

PART A

1. Fill-in the correct answers in the blank spaces provided (1 point each).

I. The primary lysosomes originate from————
II. The enzymes in them are known as ————
III. ———-are membrane-bound organelles comprising of 3 units (saccules, vesicles and vacuoles).
IV. ———engage in multiple functions by participating in steroid synthesis, glycogen and cholesterol synthesis, and they capture or release calcium ions for the skeletal muscles.
V The free ribosomes are ———
VI. All cells have ribosomes except———
VII. Chromatin materials are made of———and———
VIII. In dividing cells chromatin materials are organized into———
IX. Cells that are growing or, actively synthesizing proteins have prominent————
X. In protein synthesis production, tRNA gathers———-molecules in the cytoplasm to the mRNA on the ribosomes which move along the length of the tRNA(decoding).

2.True or False (1 point each).

Write True if the sentence is correct and False if it is wrong.

a) Golgi apparatus acts as sites for the synthesis of steroids.
b) Cells that have secretory functions have prominent Golgi apparatus.
c) Mitochondria are self-replicating.
d) Specific DNA for cytoplasmic inheritance are absent in Mitochondria.
e) Mitochondria are granular cytoplasmic organelles of all aerobic cells of higher animals, plants and microorganisms.
f) Micro bodies or perioxisomes contain oxidative enzyme called hyaluronidase.
g) Microbodies carry out detoxification of hydrogen peroxide produced in the cells.
h) Transfer vesicles aid the movement of synthesized proteins to the Golgi apparatus.
i) Ribosomes (the angular particles), are made up of DNA and proteins.
j) In multicellular organism, the shape of the cell depends mainly on its functional adaptations.

3. Multiple Choice (1 point each).

Put a circle round the most appropriate answer in the options provided.

I. The granules that appear singly and are smaller particles in carbohydrate storage in cells are:
   a) alpha particles
   b) beta particles
   c) melanosomes
   d) matrix granules

II. The granules that represent the binding site for calcium ions in muscle cells are:
   a) fine matrix granules
   b) dense matrix granules
   c) smaller matrix granules
   d) larger matrix granules

III. The type of ribosome that denotes a pathologic condition is:
   a) Microsome
   b) Antibody
   c) Phagosome
   d) multiregulated

IV. In the nucleolus, particles are:
   a) DNA
   b) filaments
   c) RNA
   d) Proteins

V. Cells that are actively synthesizing proteins or growing have:
   a) prominent nucleoli
   b) no nucleoli
   c) few nucleoli

d) many nucleoli

VI. Other proteins of the plasma membrane serve as:
   a) Antibodies
   b) Antigens
   c) Sensors
   d) Neurotransmitters

VII. This is not part of the nucleolus
   a) pars granulosa
   b) pars fibrosa
   c) nucleolar sap
   d) nucleosides

VIII. These biomolecules are not in permanent fixed locations but may be positioned at variable locations in the fluid state
   a) integral membrane proteins as well as lipids
   b) glycocalyx and oligosaccharides
   c) peripheral membrane proteins
   d) plasmalemma

IX. One of the functions of the cell membrane is
   a) Energy transfer
   b) Regulation of intercellular concentration of substances
   c) Oxidative phosphorylation
   d) Dehydrgenation

X. Hydrolytic enzymes of the lysosomes
   a) aid RNA polymerase
   b) prevent reverse transcriptase
   c) function in internal digestion
   d) accelerate protein synthesis.

PART B (Essay)

Answer any TWO (2) questions (15 points each).

1. State concisely the functions of mitochondria (15 points).
2. Elaborately describe the functions of the cell membrane (15 points)
3. Describe extensively, the nuclear membrane (15 points).
4. Write short notes on the following.
   i. Functions of the Golgi apparatus (5 points)
   ii. Enzymes of the inner membrane of the mitochondria (5 points)
   iii. The nucleolus (5 points)