Government Degree College, Baramulla (Autonomous)

Term End External Examination 4th Semester (Session- July 2024)

Subject: Clinical Biochemistry

Course No and Title: CBCC2422M/ Cell Biology and Disorders

Time: 2.15 hours Max Marks:100 Min. Marks:40

Section A: Objective Type Questions

Q1. Choose the appropriate Answer: (8x1.5=12)

i. The Fluid Mosaic Model of the cell membrane was proposed by

A Singer and Nicolson **B** Watson and Crick

C Meselson and Stahl **D** Franklin and Wilkins

ii. The sodium-potassium pump is an example of

A Primary active transport **B** Secondary active transport

C Facilitated diffusion **D** Simple diffusion

iii. Which checkpoint ensures that the cell's DNA is properly replicated before mitosis?

A G1 checkpoint **B** G2 checkpoint

C M checkpoint **D** S checkpoint

iv. Which protein complex is responsible for the initiation of DNA replication at the G1/S checkpoint?

A Cyclin A/CDK2 complex **B** Cyclin E/CDK2 complex

C Cyclin B/CDK1 complex **D** Cyclin D/CDK4 complex

v. Microtubules are primarily composed of:

A Actin **B** Tubulin

C Keratin **D** Myosin

vi. Cilia and flagella are composed of:

A Intermediate filaments **B** Actin filaments

C Microtubules **D** Ribosomes

vii. Centrioles play a critical role in:

A Protein synthesis **B** Cell division

C Energy production **D** Cell signaling

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viii. Cilia differ from flagella in that they are usually:

A Longer and fewer in number **B** Shorter and more numerous

C Involved in cell division **D** Involved in protein synthesis

Section-B: Descriptive Type Questions (Short Type)

Q2: Answer all the Questions (8 x 4 =32)

i. Explain how facilitated diffusion is different from active transport.

ii. How does the sodium-potassium pump maintain cellular homeostasis?

iii. What are the key checkpoints in the cell cycle, and how do they function?

iv. What is the role of cyclins in the regulation of the cell cycle?

v. Describe the structural organization and function of mitochondria.

vi. Explain how microfilaments contribute to cell movement.

vii. What are lysosomal storage diseases, and how do they impact cellular function?

viii. What are mitochondrial diseases, and how do they affect cellular function?

Section – C: Descriptive Type Questions (Medium Type)

Answer all the questions: (4 x 7=28)

Q 3. Describe the chemical components of biological membranes and their functions.

OR

Compare and contrast simple diffusion and facilitated diffusion.

Q 4. Compare and contrast mitosis and meiosis in terms of their processes and outcomes.

OR

Discuss the regulation of the cell cycle and the consequences of dysregulation.

Q 5. Explain the role of the endoplasmic reticulum in protein and lipid synthesis.

OR

Discuss the structure and functions of the nucleus in eukaryotic cells

Q6. Explain the components and functions of the cytoskeleton in cells.

OR

Explain the mechanisms by which mitochondria produce ATP.

SECTION – D: DESCRIPTIVE TYPE QUESTIONS (Long Type)

Answer any two of the following: **(2 x 14=28)**

Q7. Describe the various types of cell membrane transport and their significance in cellular function.

Q8. Describe the various stages of the cell cycle and their regulation.

Q9. Discuss the roles of the endoplasmic reticulum in protein and lipid synthesis and their importance to cellular function.

Q10. Discuss the structure and functions of lysosomes and the impact of lysosomal storage diseases on cellular health.