

## SARDAR PATEL UNIVERSITY

M.Sc [Biochemistry] I<sup>st</sup> semester Examination

Tuesday, 19-03-2019, 10:00 a.m. to 1:00 p.m.

Subject: PS 01 CBIC 01/PS01 CBIC 21, Cell Biology &amp; Genetics

Max Marks : 70

SC

Q.1 Choose the most correct answer and write in the answer sheet.

(08 marks)

1. What is the function of Golgi Complex?
  - (a) Processing of nascent proteins
  - (b) Glycosylation of proteins
  - (c) Secretion of newly synthesized proteins
  - (d) all of the above
2. In which stage of mitosis do all chromosomes align in one plane?
  - (a) Anaphase
  - (b) Telophase
  - (c) prophase
  - (d) metaphase
3. Which one of the following organelle is involved in metabolism of drugs?
  - (a) a nucleus
  - (b) The endoplasmic reticulum
  - (c) a mitochondrion
  - (d) a chloroplast
4. Glucose-6-phosphatase is present only in one of the following organelle and acts as a marker enzyme for confirmation of its isolation
  - (a) lysosome
  - (b) mitochondrion
  - (c) Endoplasmic reticulum
  - (d) Golgi apparatus
5. In which of the following cellular site, synthesis of nucleotides and fatty acids take place?
  - (a) cytoplasm
  - (b) mitochondrion
  - (c) Endoplasmic reticulum
  - (d) Golgi apparatus
6. MPF is a protein kinase, requiring a mitotic cyclin and it
  - (a) inhibits mitosis
  - (b) promotes mitosis
  - (c) slows mitosis
  - (d) none of the above
7. When fused with an S-phase cell, cells in which of the following phases of the cell cycle will initiate DNA replication prematurely?
  - (a) G1
  - (b) G2
  - (c) M
  - (d) all of the above
8. Linkage results in
  - (a) Formation of more dominant phenotype
  - (b) Formation of more parental phenotype
  - (c) Formation of more wild type phenotype
  - (d) Formation of more recombinant phenotype

Q.II Answer the following questions in short. (Any seven).

(14 marks).

- 1) Differentiate between euchromatin and heterochromatin.
- 2) What are the sizes of eukaryotic and prokaryotic cells? Give examples.
- 3) What are cell junctions? Give examples along with their functions.
- 4) What is the function of nucleolus?
- 5) Explain the role and availability of cyclins in cell cycle.
- 6) Which cell organelle can store water, sugars, ions and pigments?
- 7) What is cytokinesis? What happens in animal cells for cytokinesis?
- 8) Give example and explain the phenomenon of co-dominance.
- 9) Explain the phenomenon of epistasis.

**Q.III Answer the following questions:**

Q.3 (a) Giving an over view of structure of plasma membrane and briefly discuss the types of membrane proteins and their functions (06)

(b) Write an explanatory note on the size, structure, function and importance of Nucleus. (06)

**OR**

(b) Outline the main mechanisms by which material is transported across the cell membrane. (06)

Q.4 (a) Draw a diagram and explain the structure, organization and function of chloroplast. (06)

(b) Giving a brief over view of ribosomes, present their structure based on asymmetrical model. (06)

**OR**

(b) Explain the process of protein folding and processing from RER to Golgi apparatus. (06)

Q.5 (a) Explain the process of crossing over between two sister chromatids in meiosis (06)

(b) Name the phases of cell cycle in which following biochemical events occur (06)

i) Packaging of DNA into chromosomes ii) replication of centrioles

iii) biosynthesis of histones

iv) dissolution of nuclear envelope

v) replication of DNA

vi) capturing of chromosomes by spindles

**OR**

(b) Giving an overview of the composition and organization of cytoskeletal elements, discuss in brief their role in cell division, wall formation and transport. (06)

Q.6 (a) Give examples and explain the concept of multiple allelism. (06)

(b) What is linkage? Explain the phenomenon of linkage and crossing over using Morgan's experiment on drosophila white eyes and miniature wings genes. (06)

**OR**

(b) In fruit flies, the wild eye color (deep red) is dominant (R) over the white (r). If red eyed wild female fruitfly is crossed to a white eyed male, produces 60 red eyed & 63 white eyed offsprings. When this red eyed female fruitfly was crossed to a red male, it produced all red offsprings. What must be the genotype of the three parent flies? (06)

~~X~~

(2)