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SARDAR PATEL UNIVERSITY
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M.Sc Biochemistry, I Semester
Friday, Date: 1 - 04 -2016
Time 10.30 a.m. to 1.30 p.m.
Subject /Course Code PS 01 CBIC 01
Subject/Course Title: Cell Biology & Genetics

Max Marks : 70

Q.1 Choose the most correct answer for following questions. **(08)**

1. Which one of the following eukaryotic cell structures does not contain DNA?
   (a) Nucleus (b) Mitochondria (c) Endoplasmic reticulum (d) Chloroplast
2. The major function of ribosome is to
   (a) make amino acids (b) make proteins (c) breakdown proteins (d) make sugar
3. Which of the following is prokaryotic cell?
   (a) *Caenorhabditis elegans* (c) *Saccharomyces cerevisiae*
   (b) *Escherichia coli* (d) none of the above
4. Cell theory states that
   (a) all living things are composed of cells and all cells arise from preexisting cells
   (b) cells contain hereditary material which they pass to daughter cells
   (c) The chemical composition of all cells is quite similar
   (d) All of the above
5. If a group of normal people produces 312 normal and 103 albino offspring, what could be genotype of parents?
   (a) AA x aa (b) Aa x AA (c) aa x aa (d) Aa x Aa
6. Which structure of a cell is responsible for moving of chromosomes during mitosis?
   (a) Nucleolus (b) nuclear membrane (c) spindle (d) cytoplasm
7. During which phase of meiosis, do chromatids separate completely?
   (a) Metaphase I (b) Anaphase I (c) Telophase II (d) Anaphase II
8. An allele is
   (a) Another word for gene (c) a homozygous genotype
   (b) A heterozygous genotype (d) one of several possible forms of gene

Q.2 Answer **ANY SEVEN** of the following questions. (7 X 2 = 14)

1. Which cell organelle can store water, sugars, ions and pigments?
2. In prokaryotic cells, which do not contain cell membrane, how ATP is synthesized?
3. Differentiate between endocytosis and phagocytosis.
4. What happens in G1 phase of the cell cycle?
5. Differentiate between cytokinesis in plant cells and cytokinesis in animal cells.
6. What outcome would you expect from the cross between tall, round (TTRR) x short, wrinkled (ttrr)?
7. Define phenotype and genotype.
8. What is the second law of Mendel?
9. Give example and explain the phenomenon of co-dominance.

Q.3 (a) Compare the structure and organization of prokaryotic and eukaryotic cells. (06)

(b) Explain the structure of nucleus, nuclear envelope and nuclear pore. Also explain Nuclear transport. (06)

OR

(b) Discuss types of Membrane proteins and their functions. (06)

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

(b) Explain the structure and functions of endoplasmic reticulum in organization of a cell. (06)

OR

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

Q.5 (a) Explain in detail the activation of cyclin dependent kinase. Also give its function. (06)

(b) What is apoptosis? Describe the difference between necrosis and apoptosis. (06)

OR

(b) Explain the cell cycle check points that regulate the cell division. (06)

Q.6 (a) Describe the deviations from the Mendel's laws. (06)

(b) Suppose you observed a novel plant which bears a red color flower instead of normally observed purple color flower. If red-color-flower plant upon selfing produces seeds which upon sowing & growing gives 20 red-color-flower plants and 7 purple-color-flower plants, determine the genotype of the original plant you had observed. (06)

OR

(b) A man with Type O blood marries a woman with heterozygous Type A blood. What are the possible phenotypes of the children. (06)
