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SEAT No._____ No. of Printed Pages: 02

SARDAR PATEL UNIVERSITY
M. Sc. Biochemistry (I Semester) Examination
Monday, 22nd October 2018
Time: 10. 00 a. m. to 1.00 p. m.
Paper: PS01CBIC01 (Cell Biology & Genetics)

Total Marks: 70

N.B.: (i) Answers of all the questions (including multiple-choice questions) should be written in the provided answer book only.
(ii) Figures in the right indicate marks.

Q1. Choose the most appropriate answer for the following multiple choice questions: (8)

(i) The function of the nucleolus in the cell is:
(a) Biogenesis of ribosomes; synthesis of RNA protein
(b) Synthesis of DNA
(c) Synthesis of ribosomes
(d) Synthesis of RNA

(ii) Enzymes of β- oxidation of fatty acids to acetyl coenzyme A are located in which cellular organelle?
(a) Ribosomes (c) Glyoxysomes
(b) Golgi body (d) Nucleus

(iii) Which structure of a cell is responsible for moving of chromosomes during mitosis?
(a) Nucleolus (b) nuclear membrane (c) spindle (d) cytoplasm

(iv) Which of the following organelle functions to package and deliver proteins?
(a) lysosome (c) Endoplasmic reticulum
(b) Proteasome (d) Golgi apparatus

(v) Which of the following ideas of Mendel had to be modified after rediscovery of his laws?
(a) That characters are controlled by a single gene
(b) The only possible relation between two alleles is dominant and recessive
(c) Only two alternative forms for each character (only two alleles) possible
(d) all of the above

(vi) During which phase of meiosis, do chromatids separate completely?
(a) Metaphase I (b) Anaphase I (c) Telophase II (d) Anaphase II

(vii) When coding sequence region of one gene is replaced with that of a different gene sequence, the technique is referred to as
(a) mutation (b) knock out (c) Knock in (d)none of these

(viii) When two or more than two factors (genes) are considered together in a breeding experiment, these factors
(a) would show independent and random assortment
(b) would not show independent assortment
(c) will show independent or unindependent assortment depending upon their location
(d) none of the above

(P.T.O.)

Q2. Answer <u>any SEVEN</u> of the following questions in brief: **(7 X 2 = 14)**

1. Differentiate between apoplast and symplast transport.
2. Explain the phenomenon of endocytosis and how it differs from phagocytosis?
3. Present in brief the importance of microscope in the study of cell.
4. What happens in G1 phase of the cell cycle?
5. What outcome would you expect from the cross between tall, round (TTRR) x short, wrinkled (ttrr)?
6. Give example and explain the phenomenon of co-dominance.
7. What is the function of nuclear pore?
8. Differentiate between euchromatin and heterochromatin
9. Define apoptosis

Answer the following questions in details: **(4 X 12 = 48)**

Q3. (a) Compare the structure and organization of prokaryotic and eukaryotic cells. (6)

(b) Outline the main mechanisms by which material is transported across the cell membrane. (6)

<u>OR</u>

(b) Give an illustrative account of the formation of primary and secondary lysosomes and discuss the role of secondary lysosomes in the cellular digestive processes (6)

Q4. (a) Write an explanatory note on the chloroplast structure and its functional relationship (6)

(b) Give a brief account of the structure of Golgi complex and discuss how it coordinates with other organelles in transport of materials to their proper destination (6)

<u>OR</u>

(b) Explain the process of protein folding and processing from RER to Golgi apparatus. (6)

Q5. (a) Explain various phases of prophase I of meiosis. (6)

(b) What is meant by cell cycle checkpoint? How does a cell stop its progression at one of these check points? (6)

<u>OR</u>

(b) Define cytoskeleton. Describe its main components and functions. (6)

Q6. (a) What is linkage? How does it affect assortment of genes? (6)

(b) Give examples and explain the concept of multiple allelism. (6)

<u>OR</u>

(b) Find out the genotypes of the parents in following case:
'A group of people with an identical genotype residing on an isolated island over a period of 14 years produced 324 normal and 106 albino offsprings'. (6)