[90] SEAT No._____ No. of Printed Pages : 2

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SARDAR PATELUNIVERSITY

M. Sc. (I Semester) BOTANY (CBCS) Examination

Monday, 22nd October 2018

Time: 10.00 a.m. to 1.00 p.m.

Paper: PS01CBOT21 (Cell and Molecular Biology)

Total Marks: 70 (Seventy only)

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) Oxidative metabolism is carried out _____of mitochondria

(a) in the intermembrane space
(b) on the surface of the inner membrane
(c) in the inside of the outer membrane
(d) (d) in the matrix

(ii) Proteins synthesized by the rough ER are

(a) for internal storage
(b) to build more membranes in the cell
(c) to digest food in lysosomes
(d) exported from the cell

(iii) Glycoproteins and glycolipids assembled in Golgi bodies are packaged for distribution in

(a) cisternae
(b) lysosomes
(c) peroxisomes
(d) liposomes

(iv) Enzymes of β- oxidation of fatty acids to acetyl coenzyme A are located in which cellular organelle?

(a) Ribosomes
(b) Glyoxysomes
(c) Golgiody
(d) Nucleus

(v) The Watson-Crick DNA structure is also known as

(a) A DNA **(b)** B DNA **(c)** C DNA **(d)** Z DNA

(vi) During initiation of replication in eukaryotes, the primer is synthesized by DNA polymerase

(a) Alpha **(b)** Beta **(c)** Delta **(d)** Kappa

(vii) The 5'cap of eukaryotic mRNAs are incorporated by the addition of a

(a) 7 methyl Guanosine
(b) Inosine
(c) Dihydrouridine
(d) none of the above

(viii) The specific nucleotide sequences recognized by transcription factors for RNA polymerase binding are known as

(a) Consensus sequences
(b) Promoters
(c) Conserved sequences
(d) Cis acting elements

(P.T.O.)

Q2. Answer any SEVEN of the following questions briefly: (7 x 2 = 14)

(i)) Explain how the inventions of Phase-Contrast microscope and Electron microscope have helped the development of Cell Biology.

(ii Comment upon the functions of extracellular matrix

(iii) Explain the statement, "Although most of a cell's DNA is contained in the cell nucleus, the mitochondrion has its own independent genome"

(iv) Differentiate between endocytosis and phagocytosis

(v) Explain the polarity of golgi complex and functions of each of its polar regions.

(vi) Write a note on the structure of ARS

(vii) What is the role of DNA ligase in replication?

(viii) Explain why the two strands of DNA are antiparallel?

(ix) What are promoters? Briefly write on the promoters for RNA polymerase III.

Answer the following questions in detail:

Q3 (a) With suitable illustrations, discuss the types of membrane proteins and their functions. Also add notes on the main mechanisms by which material is transported across the cell membrane. **(6)**

(b) Presenting a very brief illustrative account of structure of nucleus, briefly discuss the molecular traffic through nuclear pore complexes **(6)**

OR

(b) Discuss that "different components of photosynthetic apparatus are localized in different areas of the grana and the storma lamellae" and justify "chloroplasts are semi-autonomous organelles". **(6)**

Q4. (a) 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)**

(b) Giving a brief over view of ribosomes, present their structure based on asymmetrical model. **(6)**

(b) Explain the molecular events that take place during cell cycle and discuss the mechanism/s of regulation of cell cycle. **(6)**

Q5. (a) Give a comparative account of the structures of A, B and Z DNA **(6)**

(b) Explain the role of telomerase in replication of DNA with suitable diagrams **(6)**

OR

(b) Write a note on the mechanism and significance of mismatch repair of DNA **(6)**

Q6 (a) Outline the steps involved in the initiation of transcription by RNA polymerase II **(6)**

(b) List the various chemical modifications of RNA. What is their role in tRNA function? **(6)**

(b) Write a note on initiation of translation in eukaryotes with a note on the functions of translation factors **(6)**

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