647510 **BSc6BotC603x** **Seat No :_____**

B.Sc. Semester - 6 (*CBCS*) Examination
March/April-2026 (NEW COURSE)
Cytogenetics, Molecular - Bio. (Core (New))

Time: 2:30 Hours **Marks: 70**

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

Que.1(A) Answer very shortly (04)

(1) What are nuclear pores? State their function.

(2) Give the two location of ATPase enzyme

(3) Match the following column – I with II correctly

Column - I	Column - II
(a) Cristae	(i) Flat membranous sacs in stroma
(b) Stroma	(ii) Infoldings in mitochondria
(c) Thylakoids	(iii) Dark reaction

(4) Which of the following is correct :

(a) Cells of all living organisms have a nucleus.

(b) Both animal and plant cells have a well defined cell wall.

(c) In prokaryotes, there are no membrane bound organelles.

(d) Cells are formed de novo from abiotic materials.

Que.1(B) Answer shortly (Any one) (03)

(1) Discuss the composion of plant cell wall

(2) Give the functions of nucleus.

Que.1(C) Answer in detail (any one) (07)

(1) Give information about structure, location and function of mitochondria

(2) Describe structure and function of Chloroplasts.

Que.2(A) Answer very shortly (04)

(1) Name the scientist who has done genetic mapping ?

(2) What are mutagens?

(3) What is linkage?

(4) What are linkage groups?

Que.2(B) Answer shortly (Any one) (03)

(1) Give scientific reasons: Linkage and crossing over of genes are alternatives of each other.

(2) Explain the terms: Point mutation, Frame shift mutation.

Que.2(C) Answer in detail (Any one) (07)

(1) Explain the Hardy-Weinberg's law

(2) Write a short note on Chromosome map

Que.3(A) Answer very shortly (04)

(1) Give the name of t-RNA's five arms.

(2) What is operator gene? State its role.

(3) Give the role of cAMC-CAP complex in lac operon.

(4) What are the three steps of excision repair

Que.3(B) Answer shorlty (Any one) (03)

(1) Explain separation and isolation of the Genetic material (DNA).

(2) Discuss the functions of structural gene in Lac operon.

Que.3(C) Answer in detail (Any one) (07)

(1) Describe the detail structure of m-RNA

(2) Write a short note on Genetic code

Que.4(A) Answer very shortly (04)

(1) Describe briefly : Origin of replication

(2) What does “H”, “ind” and “III” refer to in the enzyme Hind III ?

(3) Match the columns I and II correctly

Column - I	Column – II
(a) Ligase	(i) It removes nucleotide from DNA end.
(b) Endonuclease	(ii) Connects parts of DNA
(c) Exonuclease	(iii) Removes phosphates of DNA
(d) DNA Polymerase	(iv) It produces sticky ends in DNA
	(v) Useful to get repeated amplification

(4) A recombinant DNA molecule was created by ligating a gene to a plasmid vector. By mistake, an exonuclease was added to the tube containing the recombinant DNA. How does this affect the next step in the experiment, i.e. bacterial transformation?

Que.4(B) Answer shortly (Any One) (03)

(1) How is Genetic Engineering better than hybridization?

(2) Explain ‘Restriction enzymes’ as an important tool of recombinant DNA technology.

Que.4(C) Answer in detail (Any one) (07)

(1) Give information about Bt cotton.

(2) Write the characteristics of cloning vectors, describe cloning sites.

Que.5(A) Answer very shortly (04)

(1) Give the names of HPLC components

(2) What is Thin Layer Chromatography?

(3) What is electrophoresis and its uses?

(4) Name the gases used in GC?

Que.5(B) Answer shortly (Any one) (03)

(1) Write a short note on types of detectors used in GC.

(2) Discuss the operational process of gel electrophoresis.

Que.5(C) Answer in detail (Any one) (07)

(1) Explain: Amplification of gene of interest using PCR

(2) Describe the instrumental design of HPLC.

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