

B.Sc. Semester - 6 (CBCS) Examination
March/April-2024 (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.

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- Que.1(A) Answer in very short. (04)
- (1) Name the organelle involved in Cell wall synthesis?
 - (2) which structure is used for transfer of macro-molecules between the cytoplasm and nucleoplasm?
 - (3) Fill in the blank: The Thylakoid membrane contains minute spherical particles are called.....
 - (4) True or false: The number of mitochondria in a cell depends on functional state of the cell.
- Que.1(B) Answer in brief. (Any one) (03)
- (1) Discuss the difference between primary and Secondary cell wall in plant.
 - (2) Explain: Role of mitochondria in Cell respiration.
- Que.1(C) Answer in details. (Any one) (07)
- (1) What is nuclear pore? Explain the entire structure of nuclear pore.
 - (2) Discuss the origin & ultra-structure of Chloroplast.
- Que.2(A) Answer in very short. (04)
- (1) Name the phase and stage of meiosis when the homologues chromosomes begin to separate from each other.
 - (2) There are 4 pairs of chromosomes in a Drosophila. How many linkage groups are present in it?
 - (3) Fill in the blank: A point mutation comprising the substitution of purine by pyrimidine is Called _____.
 - (4) True or false: When the population is in equilibrium, there is no possibility for evolutionary change and hence the rate of evolution is zero.
- Que.2(B) Answer in brief. (Any one) (03)
- (1) What is chromosome map? Discuss the procedure for chromosome mapping.
 - (2) Write notes on: The mechanism of crossing over.
- Que.2(C) Answer in details. (Any one) (07)
- (1) What is Hardy-Weinberg law? Discuss the Hardy-Weinberg equilibrium with explanation.
 - (2) What is incomplete linkage? Discuss the incomplete linkage with example.
- Que.3(A) Answer in very short. (04)
- (1) Which enzyme is responsible for Photo reactivation of DNA?
 - (2) True or false: A codon codes for the same amino acid in all organisms from Prokaryotes to Eukaryotes, this characteristic in Genetic code is called _____.
 - (3) In which type of gene regulation, the regulator protein represses the function of structural genes?
 - (4) Out of the three kinds of RNAs, which kind of RNA is about 80% of total RNA of the cell?
- Que.3(B) Answer in brief. (Any one) (03)
- (1) Explain: The steps of DNA isolation.
 - (2) Discuss: Retrieval system or recombination repair in DNA damage.

- Que.3(C) Answer in details. (Any one) (07)
- (1) Describe the lac operon concept in Bacterium *E. coli*.
 - (2) Explain the structure and function of Transfer RNA (tRNA).
- Que.4(A) Answer in very short. (04)
- (1) Fill in the blank: Some restriction enzymes cut one strand at left side of the axis of symmetry and the other at the right side of axis, the single-stranded extension is called ____.
 - (2) Name the coupling tool which is a short double stranded DNA that has one blunt end and one cohesive end.
 - (3) True or False: The cosmid is not naturally found in living cells, it is a constructed vector.
 - (4) Name the bacterium in which the gene for Bt-toxin was isolated.
- Que.4(B) Answer in brief. (Any one) (03)
- (1) Write notes on: Stress tolerant trans-genic plants.
 - (2) Explain: Characteristic features of an ideal plasmid vector.
- Que.4(C) Answer in details. (Any one) (07)
- (1) Discuss the useful enzymes in Genetic engineering.
 - (2) Explain: Introduction of rDNA into Host(Bacterial) Cells.
- Que.5(A) Answer in very short. (04)
- (1) Fill in the blank: Polymerase used for PCR is extracted from ____ bacterium.
 - (2) Name the technique which separates charged particles using electric field.
 - (3) Complete the statement: In reversed Phase HPLC, there is a ____ solvent and ____ column.
 - (4) Give the term: In GLC, the time gap between the time of the injection of the sample and the time at which the maximum amount of solute is released in the outlet gas is called.
- Que.5(B) Answer in brief. (Any one) (03)
- (1) Explain: The procedure steps of PCR to propagate DNA.
 - (2) Discuss the principle of TLC and preparation of The TLC slide.
- Que.5(C) Answer in details. (Any one) (07)
- (1) Explain: Instrument setup and application of GLC.
 - (2) What is Paper electrophoresis? Explain steps of Amino acids separation.
