

Date: 05/12/12

Max Marks: 70

Time: 2:30 to 5:30pm

**Q.1** Select the **most appropriate answer** from the following **1×8**

- I.** \_\_\_\_\_ was the first ever cloned animal.
- Dolly
  - Molly
  - Kitty
  - Spike
- II.** Why a DNA duplex melts at a specific temperature ( $T_m$ ) on heating?
- Loss of base stacking energy
  - The double helix is intrinsically unstable
  - The single helix is more stable as compared to the double helix
  - The DNA double helix is a co-operative structure stabilized by hydrogen bonds and base pairing
- III.** The enzyme **reverse transcriptase** enables scientists to produce what product?
- Restriction endonucleases
  - cDNA molecule
  - Restriction fragment length polymorphism
  - mRNA transcript
- IV.** In the **Sanger method** of DNA sequencing, what causes the termination of chain elongation?
- The incorporation of a regular DNA nucleotide
  - The incorporation of a dideoxynucleotide
  - Denaturation of the double-stranded test fragments
  - When the DNA polymerase encounters a stop codon
- V.** All methods of **DNA fingerprinting** depend on some variation of what strategy?
- RFLP
  - Gene therapy
  - Microarray analysis
  - Nucleic acid hybridization
- VI.** **Genomic libraries** are useful for obtaining what product?
- Periodicals on genomics research
  - Collections of isolated genes
  - Instructional information on how to locate the exact site of the gene of interest
  - Information relating to primers and PCR
- VII.** The analysis and storage of the massive amount of data generated from **sequence maps** has led to the growth of what new disciplines?
- Immunology and virology
  - Bioinformatics and medical microbiology
  - Genomics and genetic engineering
  - Genomics and bioinformatics
- VIII.** The identification of **drug** through genomic study
- |                     |                     |
|---------------------|---------------------|
| a. Genomics         | c. Pharmacogenetics |
| b. Chemoinformatics | d. Pharmagenomics   |

Q.2	Attempt any seven of the following and describe in brief	2×7
I.	Ligation of DNA	
II.	Blue white selection	
III.	Reverse transcriptase	
IV.	Drawbacks of Maxam-Gilbert's method of DNA sequencing	
V.	Apyrase	
VI.	Green fluorescent proteins	
VII.	BLAST	
VIII.	SCOPE and CATCH tool	
IX.	DDBJ	
Q.3	A. Describe different steps in the gene cloning.	06
	B. Discuss principle and application of real time PCR.	06
	OR	
	B. Discuss chemical method of transformation and selection of recombinant DNA	06
Q.4	A. Describe Sanger's method of DNA sequencing.	06
	B. Explain DNA finger printing and its applications.	06
	OR	
	B. Explain site directed mutagenesis in details and its application.	06
Q.5	A. Describe reporter genes? Write down the properties of ideal reporter genes. List some commonly used reporter genes. Give detail account of any one.	06
	B. What is bio-informatics and describe applications of bioinformatics in modern research.	06
	OR	
	B. Write a note on MSA and how it is helpful to find evolutionary relationship among the species or among the genes or protein.	06
Q.6	A. Write a note on various types of BLAST in details.	06
	B. Describe shotgun approach of genome sequencing with suitable diagram.	06
	OR	
	B. Describe in details various database for 3-D structure prediction.	06

ALL THE BEST