



Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/M.Tech(BT)/SEM-2/MBT-215B/2012**

**2012**

**GENOMICS AND PROTEOMICS**

Time Allotted : 3 Hours

Full Marks : 70

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

**GROUP – A**

**( Multiple Choice Type Questions )**

1. Choose the correct alternatives for any *ten* of the following :

10 × 1 = 10

- i) Human genome contains
  - a)  $3.2 \times 10^9$  nucleotide pairs
  - b)  $4.1 \times 10^9$  nucleotide pairs
  - c)  $3.0 \times 10^9$  nucleotide pairs
  - d) none of these.
- ii) Mean gene size of man is
  - a) 29,000 nucleotide pairs
  - b) 27,000 nucleotide pairs
  - c) 26,000 nucleotide pairs
  - d) 25,000 nucleotide pairs.



- iii) Number of genes in drosophila genome is
  - a) 40,000 nucleotide pairs
  - b) 14,000 nucleotide pairs
  - c) 21,000 nucleotide pairs
  - d) 15,000 nucleotide pairs.
- iv) ORFs stands for
  - a) origin reading frames
  - b) original reading frames
  - c) operating reading frames
  - d) open reading frames.
- v) SNP stands for
  - a) single nucleotide polymorphism
  - b) simple nucleotide polymorphism
  - c) sample nucleotide polymorphism
  - d) shotgun nucleotide polymorphism.
- vi) Dscan proteins of drosophila contain
  - a) 4 axons
  - b) 5 axons
  - c) 6 axons
  - d) 1 axon.
- vii) Horizontal gene transfer refers to
  - a) transfer of gene from mother to son
  - b) transfer of gene mother to daughter
  - c) from mother to grand daughter
  - d) none of these.
- viii) Conserved syntene refers to
  - a) retention of original gene sequence
  - b) original gene sequence
  - c) original gene combination
  - d) original DNA sequence.



- ix) Human chromosome 22 is about
- a) 46 Mb in length
  - b) 48 Mb in length
  - c) 22 Mb in length
  - d) 44 Mb in length.
- x) Embryonic stem cells are suitable for
- a) gene replacement
  - b) gene manipulation
  - c) gene supplementation
  - d) gene duplication.
- xi) Transgenic mice with a mutant DNA helicase is suitable to study
- a) premature ageing
  - b) premature puberty
  - c) premature sexuality
  - d) delayed reproductive performance.
- xii) Genetic engineering is also known as
- a) gene manipulation
  - b) recombinant DNA technology
  - c) R-DNA technology
  - d) RNA technology.

**GROUP – B**

**( Short Answer Type Questions )**

Write short notes on any *five* of the following.

$$5 \times 3 = 15$$

2.  $\alpha$ -helix of protein and its molecular background of folding
3. APC
4. Bcl to family
5.  $\beta$ -sheet
6. Chaperon



7. DNA micro-array
8. Haplotype block
9. G-protein
10. PCR
11. Primary transcript
12. RNA interference
13. *sn* RNA
14. Wnt protein.

### GROUP - C

#### ( Long Answer Type Questions )

Answer any *three* of the following.  $3 \times 15 = 45$

15. What is proteomics ? What is the application of ion exchange chromatography in protein purification technique ? Comment on the isoelectric focusing.  $2 + 8 + 5$
16. Comment on the principle of mass spectrophotometry. Discuss the MALDI-TOP technique to calculate the characteristics of a protein. What is EDMAN degradation ?  $5 + 7 + 3$
17. What is protein array ? How does it differ from DNA array ? Discuss critically the applications of protein micro-arrays.  $2 + 3 + 10$
18. What is Anfinsen's dogma ? How will you depict the relationship between protein folding and amino acid sequence ? Discuss Levinthal paradox.  $3 + 7 + 5$
19. Describe any major neurodegenerative disease caused due to incorrect protein folding. Comment on the application of NMR in studying protein architecture and folding.  $10 + 5$
20. What is human genome project ? State the salient features of human genome project completed recently. What is NGP ? How is it relevant with human genome project ? What are the ethical issues related with human genomic project ?  $2 + 3 + 2 + 3 + 5$

