Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/M.TECH(BT)/SEM-2/MBT-215D/2013

2013

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 the following : $10 \times 1 = 10$

   i) Which is not a ion source in mass spectrometry ?

   a) ESI b) FAB

   c) TOF d) MALDI.

   ii) Trypsin cleave the peptide bond containing

   a) Arg or Lys b) Glu or Asp

   c) Met or Trp d) none of these.

   iii) The 2D Gel electrophoresis provides information about the proteins are

   a) MW, pI and quantity b) MW and pI

   c) pI and quantity d) none of these.

   iv) Structural proteomics deals with

   a) Cellular localization b) PTMs

   c) Edman degradation d) 3D structure.

v) In 2D Gel electrophoresis

a) Isoelectric focusing (IF) with SDS-PAGE

b) IF with another IF

c) SDS-PAGE with another SDS-PAGE

d) SDS-PAGE with ion exchange chromatography.

vi) The most widely used program for multiple sequence alignment is

a) BLAST b) FASTA

c) CLUSTAL d) CHIME.

vii) Protein-protein interactions are studied by

a) DNA foot printing

b) yeast two hybrid system

c) ligase chain reaction

d) mass spectrometry.

viii) What is PEST sequence ?

a) Proline, Glutamic acid, Serine and Threonine

b) Proline, Ethylamine, Serine and Threonine

c) Proline, Glutamin, Serine and Threonine

d) None of these.

ix) Sickle cell anemia is resulted from the

a) mutation prion protein

b) mutation in transthyretin protein

c) mutation in haemoglobin, HbA

d) mutation in α-synuclein protein.

x) Trypsin cleave the peptide bond containing

a) Arg or Lys b) Glu or Asp

c) Met or Trp d) none of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. How do you characterize a protein ?
3. What is ubiquitin ? Write down its function in cellular process.
4. What is proteomics ? How many faces of proteomics are there ? State their significance.
5. What is *c*DNA library ? How will you make *c*DNA library ?
6. What is Transcriptomics ? What is its use ?

GROUP – C

(Long Answer Type Questions)

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

7. a) "Every organism has one genome but many proteomes." Explain.
   b) Discuss the principle of any one protein estimation method.
   c) How will you prepare sample of 2D gel electrophoresis ?
   d) Discuss any one procedure of protein fractionation for 2D gel electrophoresis. 4 + 4 + 4 + 3
8. a) What is post transitional modification (PTM) ? Give few examples of PTM.
   b) What is the purpose of PTM ?
   c) Site an example where PTM changes character of the protein. 5 + 5 + 5
9. a) Discuss the working principle of MALDI-TOF MS.
   b) Write the advantages of MALDI-TOF over ESI-TANDEM. 7 + 8

10. Write short notes on any *three* of the following : 3 × 5

    a) Proteasome

    b) Ribosome

    c) Molecular phylogenetics

    d) SUMO protein.

11. Write short notes on any *three* of the following : 3 × 5

    a) 2D-NMR

    b) Protein splicing

    c) DNA microarray

    d) SNP.

12. a) Write the applications of RFLP and AFLP.

    b) Illustrate the procedure of AFLP. (5 + 5) + 5

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