[A-84]

Sardar Patel University
MSc Integrated Biotechnology Examination -Semester 8
PS08CIGMB3: Omics
Saturday 2ⁿᵈ April, 2016
2:30 pm to 5:30 pm

Total Marks: 70

Note:
1. Figures to the right indicate marks.
2. Draw neat and labelled diagram, wherever necessary.

Q.1   **Multiple choice questions**   [08]

1   Following is NOT true for pyro sequencing.
 a) ddNTPs added to all the reaction mixture
 b) Pyro phosphate produce proportional signal
 c) luciferase is present in beads
 d) it falls under category sequencing with synthesis

2   Which of the following is an example of the degeneracy of the genetic code?
 a) a given amino acid has more than one codon
 b) each codon specifies more than one amino acid
 c) the first two bases specify the amino acid
 d) the genetic code is not degenerate

3   Following statements are correct for CEPH families.
   I.   They are Reference families
   II.   Consist of Mormon families living in utah, USA-and French-Venezuaelan families
   III.   Each family consist of three generations with two grand-parents, four parents and at least six children
   IV.   Allow to study segregation
 a) I, II, III   b) I, II, IV   c) I, III, IV   d) II, III, IV

4   Which of this describes a contig
 a) a complete genomic library including overlapping clones
 b) a complete mRNA library
 c) a chromosome specific library
 d) none of these

5   _____ is an *in vivo* method for protein-protein interaction study.
 a) Far western analysis   b) Yeast 2 hybrid system
 c) Solid phase ELISA   d) all of these

6   Following is NOT true for Isoelectric focussing
 a) proteins separated based on net charge
 b) IPG strips are used
 c) proteins are migrated toward cathode
 d) Urea and thiourea used as chaotrophic agent

7   Laboratory equipment used to pinpoint all the differences in gene expression between two different cell experiment types – in a single experiment!
 a) DNA Microarray
 b) Gel Electrophoresis
 c) Polymerase Chain Reaction
 d) DNA Extraction

8   The branch of genomics deals with genetic mapping and sequencing of whole
    genome is _____
    a) functional genomics   b) comparative genomics
    c) computational genomics   d) structural genomics

Q.2   Attempt any seven   [14]

1   What is Codon bias?

2   Principle of Sanger sequencing method.

3   What is EST? Give significance of EST in human genome map.

4   Give limitations of shotgun approach.

5   Write the principle of isoelectric focussing.

6   What are reporter genes?

7   What is phage display library?

8   Briefly describe probe immobilization chemistry on microarray chip.

9   How metabolomics is different in microorganism and humans?

Q.3   A   What is C value paradox? How DNA renaturation curve unfolds the complexities?   [06]

B   What is genetic code? Compare the gene structure of prokaryote and eukaryote.   [06]

OR

B   What is massively parallel sequencing? Give comparative account on automated   [06]
fluorescent sequencing and pyro sequencing.

Q.4   A   Write goals of human genome project. Explain the vectors used in human genome   [06]
project.

B   What are physical maps? Enlist various techniques used for preparation of   [06]
physical map and explain FISH in detail.

OR

B   Narrate clone by clone sequencing approach used in HGP.   [06]

Q.5   A   Schematically represent of Mass spectrometer. What is soft ionization? Give   [06]
comparative account on soft ionization process used for proteins.

B   Why the study of protein-protein interactions is important? Write a note on solid   [06]
phase ELISA as a method to study protein-protein interaction.

OR

B   Enlist various protein visualization techniques. Describe types of organic dyes   [06]
used for protein visualization.

Q.6   A   Give comparative account on oligonucliotide and in situ fabricated microarray.   [06]

B   What is metabolomics? Write a note on importance of studying metabolomics and   [06]
give overview of Human metabolome project.

OR

B   Define transcriptomics. Describe the principle of SAGE used to determine   [06]
transcriptomics.

X=X=X