Registration No: | | | | | | | | | | |

Total Number of Pages: 02 **B.Tech.**

PBT5D001

5th Semester Regular Examination 2017-18
Genomics, Proteomics and Meta-Bolomics
BRANCH : BIOTECH
Time : 3 Hours
Max Marks : 100
Q.CODE : B185

Answer Question No.1 and 2 which are compulsory and any four from the rest.
The figures in the right hand margin indicate marks.

Q1 **Answer the following questions: *multiple type or dash fill up type*** **(2x10)**

a) Mass spectrometers are used to determine which of the following?
i) Composition in sample
ii) Concentration of elements in sample
iii) Relative mass of atoms
iv) Properties of sample

b) In mass spectrometer, the sample that has to be analysed is bombarded with which of the following?
i) Protons ii) Electrons iii) Neutrons iv) Alpha particles

c) Which of the following ions pass through the slit and reach the collecting plate?
i) Negative ions of all masses
ii) Positive ions of all masses
iii) Negative ions of specific mass
iv) Positive ions of specific mass

d) The amplitude of the NMR signal caused by the absorption of RF energy at the radio frequency does not depend upon the power of the RF energy Applied.
i) True
ii) False

e) Which of the following statements about isoelectric focusing is correct?
i) Proteins separated by isoelectric focusing cannot be tested for biological activity.
ii) Proteins separated by isoelectric focusing can be tested for biological activity.
iii) The separation of proteins by isoelectric focusing is only based on charge.
iv) The separation of proteins by isoelectric focusing is only based on size.

f) A yeast two-hybrid assay is being used to monitor interaction between two proteins, X and Y. Which of the following are true?
i)The DBD-X and AD-Y fusion proteins can substitute for missing GAL4 activity in the transfected cells
ii)The DBD-X fusion protein is able to bind to the β-galactosidase promoter.
iii)X and Y are proteins that can act as transcription factors in their native host cells,
iv)The yeast cells will be able to utilize Histidine supplied in the growth medium, and will therefore survive, upon interaction of X and Y

g) In isoelectric focusing, proteins are separated on the basis of their
i) relative content of positively charged residue only
ii) relative content of negatively charged residue only
iii) size
iv) relative content of positively and negatively charged residue

h) The proteome
i) can only usefully be studied in conjunction with the phenome
ii) refers to the entire complement of proteins
iii) is what functional genomics is primarily interested in understanding
iv) is now most commonly studied using RNA microarrays

i) What is the most challenging issue facing genome sequencing?
i) the inability to develop fast and accurate sequencing techniques
ii) the ethics of using information from genomes at the individual level
iii) the availability and stability of DNA
iv) all of the above

j) A Map Unit refers to
i) the relative distance between genes on a chromosome
ii) the chromosomes that exchange parts during meiosis
iii) the percentage of recombination
iv) A and C

Q2 **Answer the following questions: *Short answer type*** **(2x10)**

a) Write the importance of systems biology.
b) What do you understand by mining proteomes?
c) Differentiate between functional genomics and comparative genomics.
d) What is peptide fingerprinting?
e) Write the different in vivo techniques employed in protein-protein interaction studies.
f) What is pharmacogenomics study?
g) Write the different protein identification techniques.
h) Write the role of Edman's reagent in N-Terminal sequencing?
i) What is metabolomics?
j) Why is the mass spectrometer operated under conditions of high vacuum?

Q3 **a)** Discuss the role of Phage display technique useful in proteomics study. **(10)**
b) Add a note on role of Pharmacogenomics study in drug development. **(5)**

Q4 **a)** Discuss the different techniques used for the study of reverse genetics. **(10)**
b) Write a short note on Genome annotation. **(5)**

Q5 **a)** Write the prince of NMR. Discuss the steps followed in metabolite detection using NMR. **(10)**
b) How isoelectric point for proteins helps in protein separation? **(5)**

Q6 **a)** Discuss the Yeast two hybrid system and its role in protein-protein interaction study. **(10)**
b) Enumerate the different techniques used in metabolite profiling. **(5)**

Q7 **a)** Discuss the different components of a MS with suitable schematic diagram. **(10)**
b) Discuss the different ionization methods used in MS. **(5)**

Q8 **a)** Justify the role of SAGE technique in Proteomics study. **(10)**
b) Discuss the working of protein microarrays. **(5)**

Q9 **a)** Briefly explain the N-terminal sequencing of proteins technique. **(10)**
b) Discuss role of High throughput screening technique in genomic study and drug development. **(5)**