Second Year B. Sc. (Sem. IV) (CBCS) Examination
April / May - 2016
Microbiology : Paper - MB.P - 401
(Analytical Techniques & Bioinformatics)

Faculty Code : 003
Subject Code : 001420

Time : $2\frac{1}{2}$ Hours]   [Total Marks : **70**

Instructions :
1. All questions are compulsory.
2. The paper is divided in two sections.
3. There is no separate OMR sheet will be provided for Section I.
4. Figures on right indicate marks.

SECTION - I

1 Answer the following MCQ :   **20**

1. Which of the following is used as reference compound in NMR ?
   (A) Methane   (B) Tetra Methyl Silane
   (C) Ethyl alcohol   (D) None of the above

2. ISO is abbreviated for
   (A) International Organization for Standardization
   (B) International Standardization Organization
   (C) International Organization of Standardization
   (D) Internal Standard Operations

3. Which of the following is not the unit of radioactivity
   (A) Rad   (B) Curie
   (C) Gray   (D) IU

4. Which of the following spectrophotometer is used for determination of metallic elements in food industry ?
   (A) Colorimeter
   (B) UV spectrophotometer
   (C) NMR
   (D) Atomic absorption spectrophotometer

5. The role of Guard Column is
   (A) To prevent impurities to enter
   (B) To enhance column length
   (C) To reduce column diameter
   (D) To inject samples.

6. _____ is added as source of free radicals in Polymerization of PAGE.

(A) Acrylamide

(B) Bis acrylamide

(C) Ammonium persulfate

(D) TEMED

7. Stationary phase - non polar and mobile phase - relatively polar is

(A) Reverse phase chromatography

(B) Hydrophobic interaction chromatography

(C) Both of above

(D) None of above

8. Resolution is proportional to the

(A) number of theoretical plates in a column

(B) square root of the number of theoretical plates in a column

(C) square of the number of theoretical plates in a column

(D) cube root of the number of theoretical plates in a column

9. Which of the following is not required for PCR ?

(A) Taq DNA polymerase

(B) Mg^{2+} ions

(C) Topoisomerase

(D) dNTPs

10. The technique that utilizes probes to detect specific RNA sequence is

(A) Southern Blot   (B) Northern Blot

(C) Western Blot   (D) Eastern Blot

11. pH biosensor is based on _____.

(A) Amperometric sensor

(B) Photometric sensor

(C) Thermometric sensor

(D) Potentiometric sensor

12. What is the chemical name of a "synthon" used in DNA synthesis ?

(A) Phosphonucleotide   (B) Phosphosulfonate

(C) Phosphoramidite   (D) Oligoramidite

13. Which of the following is not a programming language ?
    (A) C++   (B) PASCAL
    (C) MS EXCEL   (D) FORTRAN
14. Which of the following is an example of main memory ?
    (A) Hard disk   (B) RAM
    (C) Floppy Disk   (D) CD ROM
15. Unsolicited commercial email is commonly known as
    (A) junk   (B) spam
    (C) hypertext   (D) hoaxes
16. Which of the following is not system software ?
    (A) DOS   (B) MS Office
    (C) Assembler   (D) Interpreter
17. What is TrEMBL ?
    (A) Primary protein sequence database
    (B) Secondary protein sequence database
    (C) Primary protein structure database
    (D) Secondary protein structure database
18. What is not the feature of FASTA file format ?
    (A) It contains the accession number
    (B) It begins with the symbol ">"
    (C) It begins with the symbol "%"
    (D) It contains the comment line
19. The information retrieval tool of NCBI gene bank is
    (A) Entrez   (B) STAG
    (C) Text Search   (D) SeqIn
20. According to SMILES nomenclature, the symbol "N" defines
    (A) N_2 (B) NH_3
    (C) NH_4 (D) NO_2

SECTION - II

2   (a)   Answer specifically : (any **three**)   3×2=6
    1. Write the components of atomic absorption spectroscopy.
    2. Define positron and negatron.
    3. How TLC is better than paper chromatography ?
    4. Define blotting technique. Write its types.
    5. What is software ? Enlist various types of software.
    6. What is the difference between gap opening penalty and gap extension penalty ?

(b) Answer specifically : (any **three**)   3×3=9
    1. Discuss shielding and deshielding in NMR spectroscopy.
    2. Define : Cation Exchanger. Give example.
    3. Explain STR and SNPs
    4. Write a note on HTML.
    5. Define database. Give types and examples of each.
    6. Describe in brief RAPD.

(c) Write short notes : (any **two**)   2×5=10
    1. Explain the importance of quality management in industries.
    2. Describe in detail HPLC.
    3. Explain DNA finger printing.
    4. Write in detail on applications of internet
    5. Describe : BLAST and FASTA.

3 (a) Answer specifically : (any **three**)   3×2=6
    1. Define : Total Quality Management
    2. What is an isocratic elution ?
    3. What is an electroendoosmosis ?
    4. Write the principle of FISH.
    5. Enlist various input devices of computer.
    6. Write a brief note on chemiinformatics resources.

   (b) Answer specifically : (any **three**)   3×3=9
    1. Discuss the principle of Atomic Emission Spectroscopy.
    2. Write an essay on Affinity chromatography.
    3. How IEF is carried out ?
    4. Explain automated DNA sequencer.
    5. Discuss : various component parts of Control panel.
    6. Write in brief on SMILES nomenclature.

   (c) Write short notes : (any **two**)   2×5=10
    1. Discuss the principle and applications of Infra red spectroscopy.
    2. Give an elaborate account on SDS - PAGE.
    3. Southern Blotting.
    4. Usage of multimedia
    5. Describe in detail role of bioinformatics in Drug designing.