Seat No. : _____

AD-143

April-2019

M.Sc., Sem.-II

409 : Microbiology

(Tools & Techniques in Synthetic Microbiology)

Time : 2:30 Hours]   **[Max. Marks : 70**

Instructions :   (1)   Question **1** and **2** carry **18** marks.

                 (2)   Question **3** and **4** carry **17** marks.

1.   (A)   Discuss important milestones and developments in the field of Nanotechnology.   **14**

OR

           (a)   Write a note on applications of Nanotechnology in molecular biology.   **7**

           (b)   Discuss the techniques used to characterize nanoparticles.   **7**

     (B)   Answer any **four** :   **4**

           (i)   Quantum dots

           (ii)   Nanochip

           (iii)   Nanosensors

           (iv)   Photonic crystals

           (v)   AFM

           (vi)   Fullerenes

2.   (A)   Explain the principle, procedure and applications of FTIR.   **14**

OR

           (a)   Discuss the working of mass spectrometer.   **7**

           (b)   Write a note on NMR.   **7**

     (B)   Answer any **four** :   **4**

           (i)   Name the carrier gas used in GC.

           (ii)   HPLC is based on what type of chromatography ?

           (iii)   What is the mobile phase in HPLC ?

           (iv)   What is Dwell volume ?

           (v)   What is shielding in NMR ?

           (vi)   Name two detectors present in G.C.

3. (A) What is bioinformatics ? Write about the goals, scope and applications. **14**

OR

    (a) Describe Gen Bank and its various divisions. **7**

    (b) What are the steps involved in rational drug design ? **7**

(B) Answer any **three** : **3**

    (i) Define RAM.

    (ii) Define ROM.

    (iii) What is database ?

    (iv) What is PDB ?

    (v) Define Comparative Genomics.

4. (A) What is Blast ? Discuss its flavours and its applications. **14**

OR

    (a) What are the steps involved in developing multiple sequence alignment ? **7**

    (b) What is UPGMA ? Explain with a suitable example. **7**

(B) Answer any **three** : **3**

    (i) Define protein sequence motif.

    (ii) What is character based phylogeny ?

    (iii) Define Clade.

    (iv) What are the variants of Blast program ?

    (v) What is profile ?

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