M.Sc. MICROBIOLOGY
SECOND SEMESTER
MICROBIAL GENOMICS
MMB – 202
(Use Separate Answer Scripts for Objective & Descriptive)

Duration: 3 hrs.

Full Marks: 70

[PART-A: Objective]

Time: 20 min.

Marks: 20

Choose the correct answer from the following:

1X20=20

1. A small circular DNA present in bacterial cells are called as
   a. Enzymes
   b. Ribosomes
   c. Vector
   d. Plasmids

2. Which of the following enzyme is responsible for making a DNA copy from RNA?
   a. DNA polymerase
   b. Reverse transcriptase
   c. RNA polI
   d. RNA polII

3. Which of the following enzyme is required for end to end joining of DNA?
   a. DNA ligase
   b. DNA polymerase
   c. RNA polymerase
   d. Restriction endonuclease

4. Which of the following cannot be used for the separation of nucleic acids?
   a. RFLP
   b. PAGE
   c. SDS-PAGE
   d. Northern blotting

5. Find the incorrect statement about plasmids
   a. They are circular
   b. they replicate independently
   c. they are single stranded
   d. they are transferrable

6. The shotgun approach does not require knowledge of physical mapping of the clone fragments, but rather a robust computer assembly program to join the pieces of random fragments into a single, whole-genome sequence.
   a. True
   b. False

7. Name the area of a bacterial cell which contains a bacterial chromosome.
   a. Cell wall
   b Nucleoid
   c. DNA
   d Nucleus

8. Which of the following is used for determining the location of specific genes within the genome?
   a. Genomics
   b. Proteomics
   c. Cloning
   d. Annotation

9. The first completed genome sequencing project is of
   a. Haemophilus influenza
   b. Drosophila melanogaster
   c. E.coli
   d. ØX174

[1]

10. Simple sequence repeats are
    a. Also called as micro-satellite
    b. Individual specific in number and position
    c. 1-6 bp long sequences distributed along the chromosome
    d. All of these

11. One of the following is not a gene expression database?
    a. Flyview   b. Bodymap
    c. Expression Atlas   d. GenBank

12. Small cDNA sequence that represents a unique segments of an active gene is called…
    a. SNPs   b. ESTs
    c. SnRNAs   d. Contigs

13. The forensic DNA typing procedure that uses restriction endonucleases, electrophoresis,
    and Southern blotting to analyze DNA is known by the acronym:
    a. PCR   b. VNTR
    c. RFLP   d. SNP

14. During electrophoresis denaturation of the double stranded DNA is brought about by
    a. Application of current   b. Treatment with alkali
    b. Treatment with EtBr   d. Application of heat

15. The distance between two genes is measured in units known as _____.
    a. centimorgan   b. Nanomorgan
    c. Micromorgan   d. Millimorgan

16. Proteomics refers to the study of _____.
    a. Biomolecules
    b. Set of proteins in a specific region of the cell
    c. Set of proteins
    d. The entire set of expressed proteins in the cell

17. The process of finding the relative location of genes on a chromosome is called
    _____.

    a. Gene tracking   b. Chromosome walking
    c. Genome mapping   d. Chromosome walking
18. The bond between the bases and the sugars in DNA referred as:
    a. hydrogen bond   b. glycosidic bond
    c. phosphodiester bond   d. covalent linkage

19. -------------are sets of DNA clones, each of which has been derived from theinsertion of
    a different fragment into a vector followed by propagation in thehost.
    a. Gene cloning   b. Genetic engineering
    c. DNA libraries   d. gene therapy
20. Construction of a recombinant DNA involves
    a. cleaving and joining DNA with restriction endonuclease
    b. cleaving DNA with restriction endonuclease and joining with ligase
    c. cleaving DNA with restriction endonuclease and joining with polymerase
    d. cleaving DNA with ligase and joining with endonuclease

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(PART-B : Descriptive)

[Answer question no.1 & any four (4) from the rest]

1. What are specialized vectors? Briefly explain the construction and screening of cDNA libraries.   2+8=10

2. What is molecular cloning? Write the purpose of molecular cloning. Explain the steps involves in DNA cloning.   1+4+5 =10

3. What is DNA sequencing? Briefly explain the whole genome shotgun sequencing with diagram.   5+5=10

4. a. Write the characteristic of physical structure of bacterial genome.   5+5=10

   b. Write short notes on denaturing gradient gel electrophoresis

5. What is genome mapping? Write the types of genome mapping. Briefly explain the physical mapping.   1+2+7 =10

6. What is polymorphism? Write the principle, procedure, advantage and disadvantage of RAPD.   1+9=10

7. Write short notes on (any two)   5+5=10
   - a. SAGE
   - b. SNP
   - c. ESTs

8. What is proteomics? What are the purposes of proteomics? Describe the types and procedure of proteomics.   1+2+7 =10

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