2023/12

B.Sc. MICROBIOLOGY
THIRD SEMESTER
BIOINFORMATICS AND BIOSTATISTICS
BMB-302
[USE OMR SHEET FOR OBJECTIVE PART]

SET
A

Duration: 1hr. 30 mins.

Full Marks: 35

(**Objective**)

Time: 15 mins.

Marks: 10

Choose the correct answer from the following:

$1 \times 10 = 10$

1. The movement of DNA from the gel to nitrocellulose membrane in southern blotting occurs through:
   a. Absorption
   b. Capillary action
   c. Blotting
   d. None of the above

2. Cardinality is the:
   a. No. of tupules
   b. No. of degree
   c. Domain
   d. Attributes

3. The suitable substitution matrix to align closely related sequences is:
   a. PAM 250 or BLOSUM 80
   b. PAM 40 or BLOSUM 80
   c. PAM 120 or BLOSUM 40
   d. PAM 250 or BLOSUM 40

4. The genome size of Homo sapiens is:
   a. 3000 Mb
   b. 2500 Mb
   c. 3300 Mb
   d. 2300 Mb

5. Following is an example of reverse-docking software.
   a. FlexX
   b. OpenBabel
   c. TarFishDock
   d. None of these

6. In a certain distribution, if mode = 30, median = 28, then mean = ...
   a. 27
   b. 26
   c. 29
   d. None

7. If $X \sim Binomial(6, \frac{1}{2})$, then the standard bariance of X is:
   a. 2
   b. 1.33
   c. 4
   d. None

8. Which of the following is a type-II error?
   a. Accept H0, when it is not true
   b. Accept H_0, when it is true
   c. Reject H0, when it is not true
   d. Reject H0, when it is true

9. The correlation between pressure and temperature of a perfect gas is an example of:
   a. Zero correlation
   b. Positive Correlation
   c. Negative correlation
   d. None

10. ANOVA is used to test:
    a. The significant difference between the multiple proportions
    b. The significant difference between the multiple variances
    c. The significant difference between the multiple means
    d. None

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(Descriptive)

Time : 1 hr. 15 mins.

Marks : 25

[Answer question no.1 & any two (2) from the rest]

1. Write short notes on: 2.5+2.5=5
   a) SWISS-PROT
   b) Restriction Digestion

2. Explain dynamic programming method with the help of given   10
   sequences.
   Seq 1: ATTGC   match=1
   Seq 2: AGGC   mismatch=0

3. Explain the secondary structures of protein.   10

4. Estimate the height of father, if the height of a son is 5.9 feet   10

   Height of father (in feet) :   5   5.3   5.6   5.9   6.0
   Height of son (in feet)   :   5.3   5.5   5.2   6.0   5.8

5. a) If 1% of the observations in a biological experiment are wrong due to   5+5=10
      improper handling of an experimental tool, in a sample of 200
      observations, what is the probability that at least one observation is
      wrong? [$e^{-2} = 0.1353$]
   b) A dice is thrown 60 times and the following results are obtained.

Face	:	1	2	3	4	5	6
Frequency:		8	7	12	8	14	11

   Test at 5% level of significance, if the dice is unbiased.
   [Given, $X^2_{0.05, 5} = 11.07$]

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