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BSCBTV 382

**Choice Based Credit System VI Semester B.Sc. Degree Examination,
September 2022
(2021 – 22 Batch Onwards)
BIOTECHNOLOGY (Paper – VIII)
Biostatistics and Bioinformatics**

Time : 3 Hours

Max. Marks : 80

PART – A

1. Answer **any ten** of the following : **(2×10=20)**
- What is power set ?
 - Express $5^3 = 125$ in logarithmic form.
 - Write the formula of “Binomial theorem”.
 - Define harmonic mean. Write the formula to calculate harmonic mean.
 - Define regression.
 - Define mean deviation. Write the formula to calculate it.
 - What is input device of a computer ? Give two examples.
 - Expand (a) ROM and (b) RAM.
 - What is ALU ? Mention any one of its application.
 - Define annotation.
 - Expand (a) EMBL and (b) PDB.
 - Define bioinformatics.

PART – B

Answer **any four** of the following choosing **one full** question from **each** Unit.

Unit – I

2. a) If $x = 1 + \log_a bc$, $y = 1 + \log_b ca$, $z = 1 + \log_c ab$, show that $\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = 1$.
b) Solve for x if $\log(x - 1) + \log(x + 1) = \log_2 1$.

P.T.O.



- c) Let $U = \{1, 2, 3, 4, 5, 6\}$, $A = \{2, 3\}$, $B = \{3, 4, 5\}$

Find :

- 1) A'
- 2) B'
- 3) $A \cup B$
- 4) $(A \cup B)'$
- 5) $(A')'$
- 6) $(B - A)'$
- 7) $(A \cap B)'$.

(4+4+7=15)

OR

3. a) Find the value of x , if $\log(x + 5) + \log(x - 5) = 4\log 2 + 2\log 3$.
- b) Write an antiderivative (integrals) for each of the following functions :
- i) $\cos 2x$
 - ii) $3x^2 + 4x^3$

- c) Find $\frac{dy}{dx}$, if $y + \sin y = \cos x$.

(3+5+7=15)

Unit – II

4. a) Calculate mean for following data :
- 122, 126, 154, 134, 157, 145, 143, 147, 148, 156
- b) Calculate standard deviation for following dataset.
- 20, 40, 60, 60, 75, 80, 70, 65, 70, 90
- c) Compute Karl Pearson's coefficient of correlation from the following data :

x	1	3	8	10	15	20
y	4	10	25	31	46	61

(4+4+7=15)

OR

5. a) From the following data regarding number of children per couple for 8 couples, find the average number of children.
- No. of children : 4, 3, 0, 5, 2, 1, 2, 1.
- b) Two coins were tossed, find the probability that (a) two heads are obtained
(b) two tails are obtained.



c) Calculate mean, standard deviation for following data :

Class Interval	0 – 5	5 – 10	10 – 20	20 – 30	30 – 40
Frequency	2	5	1	3	12

(3+5+7=15)

Unit – III

- 6. a) Explain digital computer.
- b) Explain peripheral devices.
- c) Discuss different components of computers. **(4+4+7=15)**

OR

- 7. a) Write a note on CPU.
- b) Illustrate computer software with suitable examples.
- c) Explain role of computers in online monitoring and automation. **(3+5+7=15)**

Unit – IV

- 8. a) Explain primary databases with suitable examples.
- b) Write a note on BLAST.
- c) Write a note on application of bioinformatics in pharmaceutical science. **(4+4+7=15)**

OR

- 9. a) Write a note on genomics.
- b) Illustrate importance of bioinformatics in structure prediction of protein.
- c) Discuss the role of bioinformatics in aquaculture. **(3+5+7=15)**
