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**B. Sc. (Bio-Technology) 2nd Sem.
(New Scheme) Examination – May, 2016**

BIO-STATISTICS

Paper : BT-201

Time : Three Hours]

[Maximum Marks : 40

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt five questions in all including Question No. 1, which is compulsory & four questions from Unit-I, II, III and IV selecting one question from each Unit.

Compulsory Question :

2 × 5 = 10

1. Explain the following :

- (a) Standard error
- (b) ANOVA

$$\sigma^2 = \frac{\sum \frac{\sum x^2}{N} - 1}{N-1}$$

- (c) Odd and even function
- (d) Primary & secondary data
- (e) Skewness

UNIT - I

2. (a) What do you understand by permutation and combination ? Least difference between them. 4

(b) $A = \begin{bmatrix} 2 & 0 \\ 1 & -1 \end{bmatrix}$ $B = \begin{bmatrix} 2 & 3 & 0 \\ 0 & 1 & 1 \end{bmatrix}$ and $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix}$. Show
that $A(B + C) = AB + AC$ 3½

3. (a) What is meant by matrix ? Describe types and their elementary operations. 4

(b) What is logarithm ? Discuss laws of logarithm. 3½

UNIT - II

4. (a) What is meant by differentiation of a function ?
Discuss its applications. 4

(b) Compute the following : 3½

$$\int \frac{x^4 + x^2 + 1}{x^2 - x + 1} dx$$

when

18
012

$\sqrt{2}x^2$

$d \frac{d^2 u v}{dx^2}$

5. (a) Explain the concept of limits & discuss its applications. 4

(b) Evaluate : 3 1/2

$$\lim_{x \rightarrow 2} \frac{x^4 + 4x^3 - 5x^2}{x - 1}$$

100
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0000
15
3x+2
y = 2/2
dx

UNIT - III

6. (a) Describe classical definition of probability, method of calculations, characteristics and limitations of classical probability. 5

(b) For every 100 apples selected, it is found in average, 25 were in grade A and 10 were in grade B. Use the addition rule of probabilities that the selected apples will have either grade A or grade B. 2 1/2

7. (a) Explain Poisson distribution, its characteristics and conditions under which it is used. 4 1/2

(b) Production of alkaloid digitalin taken for 5 consecutive batches was recorded for 200 cultivars and the frequency distribution is given below : 3

log a n x

log a n
log n
log

P(A) x P(B)
P(A and B)

log m / n log m - log n

log m n

log m / n

Digitalin (mg)	2-4	4-6	6-8	8-10	10-12	12-14	14-16
No. of Cultivars	4	60	50	36	30	15	5

Calculate mean, median and standard deviation of this distribution.

UNIT - IV

8. Explain the following :

- (a) Testing of hypothesis 4
- (b) Methods of sampling 3½

9. Write concise note on :

- (a) Test of significance 4
- (b) Chi-square test 3½

3x