PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BVoc DEGREE EXAMINATION DECEMBER 2022
(Third Semester)

Branch – **FOOD PROCESSING AND TECHNOLOGY**

MATHEMATICS AND STATISTICS

Time: Three Hours   Maximum: 50 Marks

SECTION-A (5 Marks)
Answer ALL questions
ALL questions carry EQUAL marks   (5 x 1 = 5)

1. The inverse of the matrix is possible only for
   - i) Singular matrix
   - ii) Zero matrix
   - iii) Symmetric matrix
   - iv) Non singular matrix

2. When the data is to be processed by computers, then it must be coded and converted in to the _____
   - i) English language
   - ii) Regional language
   - iii) Statistical language
   - iv) Computer language

3. The arrangement of data in rows and column is _____.
   - i) Frequency distribution
   - ii) cumulative frequency distribution
   - iii) Tabulation
   - iv) classification.

4. If the standard deviation of a data is 0.012 then find the variance
   - i) 0.144
   - ii) 0.00144
   - iii) 0.00144
   - iv) 0.0000144

5. Goodness of fit of a distribution is tested by
   - i) T-test
   - ii) F-test
   - iii) Chi-square test
   - iv) z-test

SECTION - B (15 Marks)
Answer ALL Questions
ALL Questions Carry EQUAL Marks   (5 x 3 = 15)

6. a) If $A = \begin{bmatrix} 1 & 0 \\ 4 & 7 \end{bmatrix}$ Find A^{-1}

(OR)

   b) If $A = \begin{bmatrix} 0 & 4 & 3 \\ 1 & -3 & -3 \\ 1 & 4 & 4 \end{bmatrix}$ Prove that $A^2 = 1$.

7. a) Define statistics and write the scope of statistics.

(or)

   b) Explain the types of data.

8. a) In a city, 50 families were surveyed as to how many domestic appliances they have. The replies were Recorded as given below.

1	3	2	2	2	2	1	2	1	1
2	3	3	3	3	3	3	3	2	3
3	2	2	6	1	6	2	1	5	1
1	5	3	2	4	2	7	4	2	3
1	3	4	2	0	3	4	4	3	2

Construct a frequency distribution table.

(or)

b) Draw a multiple bar diagram to represent the following data of a company.

Year	Sales	Gross profit	Net profit
	Rs.in thousands	Rs.in thousands	
2011	120	60	40
2012	140	80	45
2013	160	100	65

9.a) Find standard deviation from the following data.

Class	0-10	10-20	20-30	30-40	40-50
Frequency	5	8	15	16	6

(or)

b) Find Karl- Peasron's correlation co-efficient from the following.

X	3	5	6	7	9	12
Y	20	14	12	10	9	7

10 a) Explain the following : (i) Types of errors (ii) Level of significance.

(or)

B) Outline the Procedure for Performing one way ANOVA.

SECTION -C (30 Marks)
Answer ALL questions
ALL questions carry EQUAL Marks   (5 x 6 = 30)

11 a) If $A=\begin{bmatrix} 2 & 6 \\ 7 & 2 \end{bmatrix}$, $B=\begin{bmatrix} -3 & 5 \\ 0 & 8 \end{bmatrix}$ and $c=\begin{bmatrix} 4 & 7 \\ 9 & 5 \end{bmatrix}$ prove that A(BC)=(AB)C.

(or)

b) If $A=\begin{bmatrix} 2 & 5 & 7 \\ 2 & -1 & 0 \\ 3 & 4 & 8 \end{bmatrix}$, $B=\begin{bmatrix} 1 & 4 & 9 \\ 3 & -2 & 4 \\ -5 & 6 & 8 \end{bmatrix}$ verify that i, $(A+B)^T=A^T+B^T$ ii, $(AB)^T=B^TA^T$

12. a) Discuss the importance of statistics.

(or)

b) Discuss the difference between primary data and secondary data.

13. a) Compare the diagrammatic and graphical representations of data

(or)

b)Describe the classification and tabulation of data ?

14. a) Calculate mean, median, mode from the following data.

CI	0-5	5-10	10-15	15-20	20-25	25-30	35-40
f	9	12	15	16	17	10	13

(or)

b) Calculate Spearman's Rank Correlation co-efficient for the following data.:

X	50	60	65	70	75	40	70	80
Y	80	71	60	75	90	82	70	50

15. a) 1000 students at college level are graded according to their IQ and their economic conditions. Use chi-square test to find out whether there is any association between economic conditions and the level of I.Q

Economic condition	I.Q			
	High	Median	Low	Total
Rich Poor	160	300	140	600
	140	100	160	400
Total	300	400	300	1000

(or)

b) Explain with a suitable example for performing a paried 't' test.

Z-Z-Z END