

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2022
(Third Semester)

Branch – COMPUTER SCIENCE WITH DATA ANALYTICS

APPLIED STATISTICS

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

1. Sample is a subset of.....
(i) Data (ii) set
(iii) Distribution (iv) Population
2. An orderly set of data arranged in accordance with their time of occurrence is called.....
(i) Arithmetic series (ii) Harmonic series
(iii) Geometric series (iv) Time series
3. The condition for the time reversal test to hold with usual notations is.....
(i) $P_{01} \times P_{10} = 1$ (ii) $P_{01} \times P_{10} = 0$
(iii) $P_{01}/P_{10} = 1$ (iv) $P_{01} + P_{10} = 1$
4. Quality means degree of.....
(i) Perfection (ii) Imperfection
(iii) Both (i) & (ii) (iv) None of these
5. The sum of deviations from the _____ is always zero
(i) Median (ii) Mode
(iii) Mean (iv) None of the above

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a. Define SRSWR and SRSWOR.
OR
b. Explain Non probability sampling.

- 7 a. Find the centered 4-year moving averages from the following time series data:

Years:	1995	1996	1997	1998	1999	2000	2001	2002
Output:	30.1	45.4	39.3	41.4	42.2	46.4	46.6	49.2

OR

- b. Describe trend analysis.

- 8 a. What are the uses of Index Numbers?

OR

- b. Calculate the index number, using the aggregate expenditure method for the year 2003 with 2000 as base year, from the following data:

Commodity	Quality in units	Price per unit 2000(Rs)	Price per unit 2003 (Rs)
A	100	8	12.0
B	25	6	7.50
C	10	5	5.25
D	20	48	52.00
E	65	15	16.50
F	30	19	27.00

- 9 a. What is meant by Statistical Quality Control? Mention two types of causes for variation in a manufacturing process?

OR

Cont...

- b. A machine drills in a pipe with a mean diameter of 0.532cm and a standard deviation of 0.002cm. Calculate the Control limits for mean of sample 5.
- 10 a. Explain the steps involved in fitting a straight line trend using MS Excel.
OR
b. Write down the steps involving in calculating ANOVA using MS Excel.

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 6 = 30)

- 11 a. Describe stratified random sampling and systematic random sampling.
OR
b. Explain in detail the Sampling error and Non-sampling errors. Give an examples
- 12 a. Fit a straight line trend to the data given below by the method of least squares and estimate the number of sales men in 2003

Year	:	1998	1999	2000	2001	2002
No. of Sales men	:	28	38	46	40	56

OR

- b. Find the seasonal index from the following table by ratio to moving average method

Seasons	1999	2000	2001	2002	2003
I Quarter	40	42	41	45	44
II Quarter	35	37	35	36	38
III Quarter	38	39	38	36	38
IV Quarter	40	38	42	41	42

- 13 a. Calculate Fisher's ideal index from the data given below and show that it satisfies Time reversal test and factor reversal test.

Commodity	2000		2001	
	Price	Quantity	Price	Quantity
A	10	49	12	50
B	12	25	15	20
C	18	10	20	12
D	20	5	40	2

OR

- b. Calculate the Cost Of Living Index Number by using
i) The weighted arithmetic mean and (ii) The weighted geometric mean

Group	Index Number	Weight
Food	352	48
Fuel and Lightning	200	10
Clothing	230	8
House Rent	160	12
Miscellaneous	190	15

- 14 a. Find the values of sample mean (\bar{X}) and the range (R) for ten samples of size 5 each. Draw mean chart and comment on the state of control of the process.

Sample number	:	1	2	3	4	5	6	7	8	9	10
\bar{X}	:	43	49	37	44	45	37	51	46	43	
47											
R	:	5	6	5	7	7	4	8	6	4	
6											

Given the following control chart constraint for: $n = 5$, $A_2 = 0.58$, $D_3 = 0$ and $D_4 = 2.115$

OR

- b. Describe the control charts.
- 15 a. Explain the steps involved in measure of dispersion using MS Excel
OR
b. Explain briefly about the descriptive statistics computational functions in Excel.

Z-Z-Z

END