PG Even Semester Examination, May 2025

STATISTICS

2nd Semester

Course No. : STS - 556

(Python Programming)

Full Marks : 70

Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

Group-A

(Answer any five questions from this group)

2x5=10

1. Define Python keywords or reserved words.
2. What are the rules for writing identifiers in Python?
3. Explain python function with an example.
4. What are comments in python used for?
5. How do write good comments in Python?
6. How to assign a variable in Python?
7. What is variable in phyton?
8. Define Python's numeric data type.
9. Explain python list data type with an example.
10. What are the operators python supports?

Group - B

Answer any four questions from this group

4x10=40

11. For Shayan's statistics project he wants to create a graph the population growth (in millions) of the countries listed in the table below:

	Population over time (millions)		
Country	1980	1990	2000
United Kingdom	50	53	63
Mexico	65	78	80
Pakistan	57	65	74
Nigeria	60	82	85
France	55	56	65

What graph can Shayan create to illustrate the data over time?

12. The table below shows the amount of time a group of second semester M.Sc. (Statistics) student studies in a day before the end semester examination. The teacher wants to analyze the data the central tendency, variability and distribution of hours studied.

Dataset (hours studied) : 2, 4, 5, 8, 3, 7, 10, 6, 9, 5, 4, 8, 7, 3, 6

i) Calculate the mean, median and mode of the basic studied

ii) Determine the range, variance and standard deviation of the hours studied.

Observed Frequency (f) :

10 24 30 12 3 1

Fit a suitable distribution and state your conclusion.

17. A company wants to examine the relationship between the number of hours of training employees receive (x) and their productivity score (y) on a standarized task. The data from 8 employees is shown below:

Hours of Training (x) :

2 4 6 8 10 12 14 16

Productivity score (y) :

50 55 60 63 65 68 70 72

Fit a simple linear regression of the form :

$$y = a + bx$$

and calculate the slope (b) and intercept (a).

Part - C

18. Viva-voce 10

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iii) Find the value of Skewness and Kurtosis of the given dataset.

13. Given a dataset that records the number of hours studied and the corresponding exam score of students, how can we determine the strength and direction of their relation? Additionally, how can we visualize this relationship.

Hours studied	Exam score (%)
2	60
3	65
5	70
7	75
8	78
10	85
12	90
15	95

14. A researcher is analyzing the heights (in cm) of students from three different sections: Section A, Section B and Section C. The data below represents the heights of students in each section.

Section A	Section B	Section C
150	160	175
155	165	178
149	162	179
152	168	171
148	166	170
153	170	167

157	172	162
151	167	163
156	164	164
154	169	165

Draw a suitable plot for the given dataset to compare height distributions across the three sections.

15. A nutritionist wants to determine if a new diet plan leads to more weight loss compared to a standard diet. Two independent groups of individuals follow different diet plans for 6 weeks.

Hence the weight losses (in kg) of participants in both groups.

Group A (Standard Diet)

Participants' weight loss :

2.1, 2.5, 3.0, 2.8, 3.2, 2.7, 2.9, 2.6

Group B (New Diet Plan)

Participants' weight loss :

3.5, 3.8, 4.0, 3.7, 4.2, 3.9, 3.6, 4.1

Using a 5% level based on your result, find is there any evidence that the new diet plant results in greater average weight loss.

16. A call center records the number of customer complaints received per hour over 80 randomly selected hours. The observed data is as follows:

No. of complaints (x) :

0	1	2	3	4	5