**ALLAMA IQBAL OPEN UNIVERSITY, ISLAMABAD**

**(Department of Economics)**

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| **Warning**1. **Plagiarism or hiring of a ghostwriter (s) for solving the assignment(s) will debar the student from the award of degree/certificate if found at any stage.****2. Submitting assignments borrowed or stolen from other(s) as one’s own will be penalized as defined in the “AIOU plagiarism policy”.** |

**Course: Introduction to Statistics for Economists (9309) Semester: Spring, 2025**

**Level: MSc.**

## Please read the following instructions for writing your assignments.(AD, BS, BEd, MA/MSc, MEd) (ODL Mode).

1. All questions are compulsory and carry equal marks but within a question the marks are distributed according to its requirements.

2. Read the question carefully and then answer it according to the requirements of the questions.

3. Avoid irrelevant discussion/information and reproducing from books, study guide or allied material.

4. Handwritten scanned assignments are not acceptable.

5. Upload your typed (in Word or PDF format) assignments on or before the due date.

6. Your own analysis and synthesis will be appreciated.

7. Late assignments can’t be uploaded at LMS.

8. The students who attempt their assignments in Urdu/Arabic may upload a scanned copy of their handwritten assignments (in PDF format) on University LMS. The size of the file should not exceed 5MP.

**Total Marks: 100 Pass Marks: 40**

## Assignment No. 1

 **Units 1-5**

Q.1. You are working for the Transport manager of a large chain of supermarkets which hires cars for the use of its staff. Your boss is interested in the weekly distances covered by these cars. Mileages recorded for a sample of hired vehicles from 'Fleet 1' during a given week yielded the following data:

138 164 150 132 144 125 149 157 161 150 168 126 138 186 163 146 158 140 109 136 148 152 144 145 145 109 154 165 135 156 146 183 105 108 135 153 140 135 142 128

1. Construct a frequency distribution.
2. Construct a pie chart
3. Construct steam and leaf plot.
4. Construct a histogram and ogive curve.
5. Construct a Bar Diagram

Q.2. (i) For the following distributions, indicate which distribution:

* + 1. Has the larger average value.
		2. Is more likely to produce a small value than a large value.
		3. Is the better representation of the distribution of ages at a rock concert.
		4. Is the better representation of the distribution of the times patients have to wait at a doctor's office. **(10)**

A

B

 (ii) For the next two distributions, indicate which distribution, if any

* + 1. Have values more evenly distributed across the range of possible values.
		2. Is more likely to produce a value near 0.
		3. Has a greater likelihood of producing positive values than negative values. **(10)**

A

B

Q.3. These data represent the ages of patients admitted to a small hospital on February 28, 1996: **(20)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 85 | 75 | 66 | 43 | 40 |
| 88 | 80 | 56 | 56 | 67 |
| 89 | 83 | 65 | 53 | 75 |
| 87 | 83 | 52 | 44 | 48 |

* + 1. Construct a frequency distribution with classes 40–49, 50–59, etc.
		2. Compute the sample mean from the frequency distribution.
		3. Compute the sample mean from the raw data.
		4. Compare parts (b) and (c) and comment on your answer.

Q.4. The four floodgates of a small hydroelectric dam fail and are repaired independently of each other. From experience, it's known that each floodgate is out of order 4 percent of the time.

* + 1. If floodgate 1 is out of order, what is the probability that floodgates 2 and 3 are out of order? **(10)**
		2. During a tour of the dam, you are told that the chances of all four floodgates being out of order are less than 1 in 5,000,000. Is this statement true? Explain. **(10)**

Q.5. On a certain Monday at noon, a check was made of five different computer rooms in campus residence units. The number of students using computers in the five units was 20, 12, 10, 8, and 11, respectively.

 (a) Find the average number of users per room. **(10)**

 (b) Find the variance of this sample distribution. **(10)**

**Total Marks: 100 Pass Marks: 40**

## Assignment No. 2

 **Units 6-9**

Q.1. (a) A blindfolded man draws 3 chips, lists the outcome set and assigns a probability to each outcome assuming (i) a chip is replaced before drawing the next chip and (ii) chips are not replaced. **(10)**

 (b) Define independent events and mutually exclusive events and explain the difference between them. Must independent events be mutually exclusive exclusive? Must mutually exclusive events be independent? Give examples. **(10)**

Q.2. (a) Describe the properties of an estimator. **(10)**

(b) Consider the following random sample from a normal population: **(10)**

120 160 80 100 90

* + 1. Find the 90% confidence interval for population variance.
		2. Find the 95% confidence interval for the population variance.

Q.3. A company sets different prices for a particular DVD system in eight different regions of the country. The accompanying table shows the number of units sold and the corresponding prices (in dollars).

Sales 420 380 350 400 440 380 450 420

Price 104 195 148 204 96 256 141 109

* + 1. Graph this data and estimate the linear regression of sales on price. **(10)**
		2. What effect would you expect a $50 increase in price to have on sales? **(10)**

Q.4. Find and interpret the coefficient of determination for regression of the sales system on price, using the following data. **(20)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sales | 420 | 380 | 350 | 400 | 440 | 380 | 450 | 420 |
| Price | 98 | 194 | 244 | 207 | 89 | 261 | 149 | 198 |

Q.5. (a) What are the four components of a time series? How the seasonal variations

 can be detected and depersonalized from the time series data. **(10)**

 (b) Explain with a suitable example, how the Paasche price index differs from a simple

 arithmetic average of price relatives. **(10)**