

ALLAMA IQBAL OPEN UNIVERSITY, ISLAMABAD
(Department of Mathematics & Statistics)

WARNING

1. **PLAGIARISM OR HIRING OF GHOST WRITER(S) FOR SOLVING THE ASSIGNMENT(S) WILL DEBAR THE STUDENT FROM AWARD OF DEGREE/CERTIFICATE, IF FOUND AT ANY STAGE.**
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Course: Statistics-I (394)
Level: Intermediate

Semester: Spring, 2014
Total Marks: 100
Pass Marks: 40

ASSIGNMENT No. 1

- Q.1 a) Define and explain statistics along with its application.
b) Draw a Histogram for the following frequency distribution giving the steps involved? (10+10)

<i>Mid values (X)</i>	32	37	42	47	52	57	62	67
<i>Frequency (f)</i>	3	17	28	47	54	31	14	4

- Q.2 a) What is meant by tabulation? Explain the main steps which are generally taken in tabulation.
b) Compute Mean, Median, Mode, 6th Decile, and 74th percentile for the data given in the table: (10+10)

<i>Classes</i>	9.3-9.7	9.8-10.2	10.3-10.7	10.8-11.2	11.3-11.7	11.8-12.2	12.3-12.7
<i>Frequency</i>	2	5	12	17	14	6	3

- Q.3 a) Write down the empirical relation between mean, median and mode for unimodal distribution of moderate asymmetry. Illustrate graphically the relative positions of the mean, median and mode for frequency curves which are skewed to the right and to the left.
b) The Arithmetic Mean and Geometric Mean of three numbers are 34 and 18 respectively. Find all the three numbers, when the Geometric Mean of the first two numbers is 9. (10+10)
- Q.4 a) What do you understand by dispersion? What are the most usual methods of measuring dispersion, indicate the advantages and disadvantages of these methods separately.

- b) The following table shows the marks of students: (10+10)

<i>Marks</i>	30-39	40-49	50-59	60-69	70-79
<i>f</i>	8	87	190	86	20

Calculate variance and standard deviation.

- Q.5 a) What interpretation have the moments about mean and about an arbitrary value. Give the relation between them. Also define the moment ratios b_1 and b_2 .
- b) The second moment about mean of a distribution is 25, what would be the value of fourth moment about mean if the distribution is:
- i) Leptokurtic ii) Mesokurtic iii) Platykurtic (10+10)

ASSIGNMENT No. 2

Total Marks: 100

Pass Marks: 40

- Q.1 a) Compare the following concepts:
i) Simple and composite index ii) Fixed and chain base method
b) The prices in Rs. Per maund of coal sold during the year 1953-58 as given below:

Years	Prices	Years	Prices	Years	Prices
1953	14.95	1955	15.10	1957	16.28
1954	14.95	1956	15.65	1958	16.28

Compute index number of prices for the year 1953 as base. (10+10)

- Q.2 a) What do you understand by Conditional Probability. State and prove the multiplicative law of probability for both independent and non independent events A and B.
b) Three balls are drawn successively from a box containing 6 red balls, 4 white balls and 5 blue balls. Find the probability that they are drawn in the order red, white and blue if each ball is
i) replaced ii) not replaced (10+10)

- Q.3 a) Generate the first 6 random digits using the pseudo-random number generator with $m=100$, $a=21$, $b=7$, $x_0=10$
b) Let the digits 0, 1, 2, 3, 4 represent head and 5, 6, 7, 8, 9 represent tail, use random numbers to estimate 20 flips of a coin. (10+10)

- Q.4 a) Define expectation of random variable. The probability distribution of a discrete random variable X is given by

$$f(x) = \binom{3}{x} \left(\frac{1}{4}\right)^x \left(\frac{3}{4}\right)^{3-x}, \quad X=0, 1, 2, 3$$

Find $E(X)$ and $E(X^2)$

- b) Approximately 10% of the glass bottles coming from a production line have serious defects. If two bottles are selected at random, find the expected number of bottles that having serious defects. (10+10)
- Q.5 a) If $(q + p)^n$ is given then find the mean and variance of Binomial Distribution.
b) The mean and variance of binomial distribution are 6 and 2.4 respectively. Find p and n , the two parameters of the binomial distribution. (10+10)