

ALLAMA IQBAL OPEN UNIVERSITY, ISLAMABAD
(Department of Mathematics and 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: Intermediate Statistics-I (394)
Level: FA

Semester: Autumn, 2012
Total Marks: 100

ASSIGNMENT No. 1
(Units 1-5)

Note: All questions are compulsory and carry equal marks.

- Q.1 a) Define and explain the following terms with examples.
- | | |
|------------------------------------|--|
| i) Population | ii) Sample |
| iii) Ratio & Propotion | iv) Parameter and statistic |
| v) Order statistic | vi) Sampling variability |
| vii) Experiment & Sample Survey | viii) Descriptive and inferential statistics |
| ix) Data types and sources of data | x) Qualitative and quantitative variables |
- b) Define and construct a histogram for the following frequency distributions by giving the steps involved.

Mid values x:	32	37	42	47	52	57	62	67
Frequency f:	3	17	28	30	52	21	14	45

- Q.2 a) Define the following measures of central tendencies and give one example of each term.
- | | |
|-------------------|-------------------|
| i) Geometric Mean | ii) Harmonic Mean |
| iii) Median | v) Mode |
- b) The reciprocals of 11 values of x are given below:
- | | | | | | |
|---------|---------|---------|---------|--------|--------|
| 0.0500, | 0.4454, | 0.0400, | 0.0333, | 0.0285 | 0.0232 |
| 0.0213, | 0.0200, | 0.0182, | 0.0151, | 0.0143 | |
- Calculate Harmonic mean and arthmatic mean of x.

- Q.3 a) What do you understand by dispersion? What are the most usual methods of measuring dispersion, indicate the advantages and disadvantages of these methods?

- b) Calculate standard deviation, variance and co-efficient of variation from the following data:

y:	525	500	475	450	425	400	375	300
f:	25	34	22	40	32	17	29	34

- Q.4 a) For a group of 50 boys, the mean score and the standard deviation of test scores are 59.5 and 8.38 respectively. For a group of 40 girls, the mean and standard deviation are 54.0 and 8.23 respectively on the same text. Find the mean and standard deviation for the combined group of 90 students.
- b) Ten young recruits were put through a physical training programme by the army. Their weights were recorded before and after the training with the following results:

Recruit	1	2	3	4	5	6	7	8	9	10
Weight (before)	127	126	162	170	143	205	168	175	197	136
Weight (after)	135	200	160	182	147	200	172	186	193	141

Using $\alpha = 0.05$, should we conclude that the training programme affects the average weight of young recruits.

- Q.5 a) Define and index number? Describe the different types of index number and discuss the main points involved in the construction of index numbers of prices.
- b) The following figures show the whole sale prices of refined petroleum per gallon in UK for the year specified on the basis of year 1923 is 100, calculate prices relatives.

Years	Prices
1923	13
1924	13.5
1925	13
1926	11.5
1927	11.5
1928	12
1929	14
1930	10.5
1931	12.5
1932	11.75

ASSIGNMENT No. 2

(Units 6-9)

Total Marks: 100

Note: All questions are compulsory and carry equal marks.

- Q.1 a) Define and explain the terms permutation and combination.
- b) State and prove the multiplicative law of probability for two events A and B.
- i) Both are not stochastically independent.
- ii) Both are stochastically independent.
- Q.2 a) A bag contains 5 white and 7 black ball if 3 balls are randomly drawn from the bag. What is the probability that:
- i) All are white ii) One is black and 2 are white
- iii) All are either white or black.
- b) A class contains 10 men and 20 women out of which half men and half women have brown eyes. Find the probability that a person choosen at random is a man or has brown eyes.
- Q.3 a) Define random variable and discuss how these are generated also give an example to explain their application.
- b) Two coins are tossed and let the random variable (x) denote the number of heads. Write down the possible outcomes and the value assigned to random variable. Also construct the probability distribution of the x.
- Q.4 a) What is meant by probability distribution and distinguish between discrete and continuous random variables by giving examples.
- b) Define continuous random variable and its probability distribution. Also find the constant k so that the function f(x) defined as follows may be a density function
- $$f(x) = \begin{cases} \frac{1}{k}, & a \leq x \leq b \\ 0, & \text{else where} \end{cases}$$
- Q.5 a) If 5 true dice are thrown at once, determine the probability of getting 0, 1, 2, 3, 4, 5 sixes. Find the mean and variance of the probability distribution so obtained.
- b) Find the mean and variance of the binomial $(q + p)^3$.