



QUAID-I-AZAM UNIVERSITY ISLAMABAD

B.Sc. Annual Examinations--2013
(PART-I)

Roll No: _____

SUBJECT: **Statistics**

PAPER: **A**

Time Allowed: **3 Hours**

June 25, 2013

Max Marks: **75**

Note: Attempt total FIVE questions selecting at least two from each section.
Use of only simple scientific calculator is allowed.

SECTION-I

Q. No.1

- (a) Explain the chief characteristics of Statistics. (8)
- (b) What is meant by a frequency distribution? Describe briefly the main steps in the preparation of a frequency table from raw data. (7)

Q. No.2

- (a) For a certain frequency distribution the Mean was 40.5 and MEDIAN 36. Find the MODE approximately using the formula connecting the three. (4)
- (b) Given $n = 6$, $\sum(x - 18) = 15$, $\sum(x - 18)^2 = 54$. Find the standard deviation. (4)
- (c) Find the MEAN, VARIANCE and CO-EFFICIENT of VARIATION of the FIRST 'n' natural number (1,2,3,...n) (7)

Q. No.3

- (a) Explain the TIME and FACTOR reversal tests. (3)
- (b) The following table shows the average prices in rupees per quarter. (7)

Cereals	1990	1991	1992
Wheat	110.70	122.85	129.00
Barley	99.50	124.55	120.50
Maize	60.25	74.90	76.25

Taking 1990 as base, construct a price index number/or the three cereals together for 1991 and 1992 using the weight 12 for wheat, 8 for barley and 5 for maize.

- (c) The price and quantities of three commodities during 1980 and 1981 are given below. (5)

Commodity	1980		1981	
	P	Q	P	Q
A	10	501	12	600
B	40	100	38	194
C	50	76	40	56

Using 1980 as the base period and base period quantities as weights, compute the weighted aggregate price index for 1981.

Q. No.4

- (a) What is meant by Analysis of time series. (2)
- (b) Fit a straight line $y = a + bx$ from the following results for the year 1988-1998 (Both Inclusive). $\sum x = 0$, $\sum y = 438$, $\sum x^2 = 110$, $\sum xy = -84$ (3)
- (c) Construct seasonal indices by ratio to trend method from the following data. (10)

Year	Quarters			
	I	II	III	IV
2000	107	115	103	98
2001	118	122	115	104
2002	126	129	118	107
2003	121	122	116	103

SECTION-II**Q. No.5**

- (a) Define the following terms. (4)
- i. Sample space
 - ii. Sample point
 - iii. Simple and compound event.
- (b) A bag contains 12 balls of which 3 are marked, if 5 balls are drawn out together, what is the probability that 3 of the marked balls are among them? (4)
- (c) A can hit a target FOUR times in 5 shots, B three times in 4 shots, C twice in 3 shots. They fire a volley, what is the probability that two shots at least hit? (7)

Q. No.6

- (a) If x is a random variable and if a and b are constant then
Prove that $E(ax + b) = aE(x) + b$. (5)
- (b) A committee of size 5 is to be selected at random from 3 women and 5 men.
Find the expected number of women in the committee. (6)
- (c) Show that $E[x - E(x)]^2 = E(x^2) - (E(x))^2$ (4)

Q. No.7

- (a) What is a Binomial experiment and what are its properties. (5)
- (b) The probability that a patient recovers from a delicate heart operation is 0.9.
What is the probability that exactly five of the next 7 patients having this operation survive? (4)
- (c) In a Poisson distribution the first two frequencies were 250 and 160. Find frequencies of the next two values of the variable. (6)

Q. No.8

- (a) Show that for the Normal distribution the MEAN deviation from the MEAN is approximately $4/5$ of its standard deviation. (6)
- (b) For what value of A , the function defined as below will be a p.d.f (9)

$$f(x) = Ax^3(1-x) \quad 0 \leq x \leq 1$$

$$= 0 \quad \text{Otherwise}$$

Find MEAN and VARIANCE, also find $P(1/4 < x < 1/2)$ using its distribution function.