Date: July 10, 2010   Max Time: 3 Hrs
                                                             Max Marks: 60

INSTRUCTION:

(I)   Attempt any fiver questions
(II)   All questions carry equal marks

Q.1 (a) Differentiate between:
(i) Descriptive and Inferential Statistics. (ii) Primary and Secondary data.

(b) Define a Frequency Distribution. What are the steps involved in its preparation?

(c) Prepare a frequency distribution taking Five equal classes.

4.03	3.95	3.89	4.01	4.08	3.91	3.98	3.86	4.29	4.15
3.79	4.17	4.65	4.26	4.10	4.28	3.96	3.93	3.96	3.83
3.71	4.38	3.81	4.23	4.05	3.86	4.01	4.14	4.07	4.22

Q.2 (a) For the following frequency distribution:

Sales (x)	401–420	421–440	441–460	461–480	481–500
No. of days (f)	5	12	17	10	6

(i)   Compute mode of the distribution
(ii)   Compute first quartile.
(iii)   Compute the percentage of days when the sales is more than 475.

(b) If an instructor counts the final examination in a course four times as much as each one-hour examination, what is the average score of a student who received 76 in the final examination and 70, 54, 73, and 67 in four one-hour examinations?

Q.3 (a) For the frequency distribution given below, determine the intervals $(\mu \pm \sigma)$ and $(\mu \pm 2\sigma)$ where μ is the mean and σ is the standard deviation of the distribution.

CI	f
8.0–8.9	14
9.0–9.9	27
10.0–10.9	22
11.0–11.9	5
12.0–12.9	4
13.0–13.9	12
14.0–14.9	16

(b) The number of machine breakdowns per day in a factory is recorded for seven days in each of two months as:

June	4	10	9	0	0	8	3
August	11	4	3	2	3	0	3

Which month exhibits more variability in terms of coefficient of variation?

Please Turn Over

Q.4 (a) Find the number of distinct permutations that can be formed from all the letters of the word PROPOSITION.

(b) (i) If repetitions are not allowed, how many three digit numbers can be formed from the six digits 2, 3, 5, 6, 7 and 9?
(ii) How many are odd?
(iii) How many are multiple of 5?

(c) In how many ways can three cards be drawn from 52 playing cards?

Q.5 (a) Differentiate between Classical and Empirical Approaches of Probability.

(b) A coin is tossed four times. Find the probability of at least two heads.

(c) The time in minutes, which 15 bank account holders spent in a bank branch to get their cheques cashed, are recorded below:
8.6, 5.8, 6.7, 5.2, 6.2, 5.5, 7.5, 5.1, 5.3, 9.9, 5.9, 13.6, 15.2, 10.7, 5.2.
What is the probability that an account holder will get his cheque cashed within seven minutes?

Q.6 (c) Given that events A and B are independent, and $P(A) = 0.3$ and $P(B) = 0.6$, Compute $P(A \cup B)$.

(b) Find K such that $P(X) = \dfrac{K}{X^2}$ for $X = 1, 2, 3$ is a probability distribution. Find (i) $E(X)$ and (ii) $V(X)$.

Q.7 (a) 6 cards are drawn at random from a deck of 52 playing cards. What is the probability of getting 3 kings if the cards are drawn
(i) with replacement?
(ii) without replacement?

(b) It is known that 6% of the production of a manufacturer is defective. What is the probability that "the number of defective product" in a random sample of 10 will be exactly 2?

(c) In a steel industry the average number of fatal accidents per month is 0.5. What is the probability that there will be no fatal accident in the next month?

Q.8 (a) A sample of paired observations is given as:

X	2	3	4	5	6	7	8
Y	2	8	11	9	19	14	14

(i) Determine the Regression equation of y on x.
(ii) Determine Total, Error and Regression Sum of Squares.
(iii) Determine Coefficient of determination and interpret.
(iv) Determine Coefficient of Correlation.

(b) Compute Fisher's index number for 2010.

Commodity	2009		2010	
	Price	Quantity	Price	Quantity
A	64	270	102	320
B	40	124	70	210
C	83	130	95	125

xxx///xxx///xxx///xxx///xxx///xxx///xxx///xxx///xxx///xxx///xxx

Date: January 4, 2010

Obaid

Max Marks: 60
Max Time: 3hrs

Instructions:
- a) *Attempt all questions in the given sequence in your answer script.*
- b) *Marks of each question are mentioned in square brackets.*

Q1. [12]

a. What are the sources of data? Give examples of each.

b. The following data represent salaries (in rupees) from a district school in Karachi.

10,000	11,000	11,000	12,500	14,300	17,500
18,000	16,600	19,200	21,560	16,400	107,000

i. First, assume you work for the school board in Karachi and do not wish to raise taxes to increase salaries. Compute the mean, median, and mode, and decide which one would best support your position to not raise salaries.

ii. Second, assume you work for the teachers' union and want a raise for the teachers. Use the best measure of central tendency to support your position.

iii. Explain how outliers can be used to support one or the other position.

iv. If the salaries represented every teacher in the district school, would the averages be parameters or statistics?

v. Which measure of central tendency can be misleading when a data set contains outliers?

vi. When you are comparing the measures of central tendency, does the distribution display any skewness? Explain.

vii. Calculate the range and standard deviation for the salaries. And discuss why the standard deviation preferable to the range as a measure of dispersion.

Q2. [04+04]

a. Three horses A, B & C are in a race. A is twice as likely to win as B and B is twice likely to win as C. What is the probability that A or B wins?

b. In an experiment of rolling a six-sided die:
Let   F = event a 5 is rolled
O = event the die comes up odd
i. P(F), Find the probability that a '5' is rolled.
ii. P(F/O) Find the probability that a '5' is rolled given that the die comes up odd.
iii. P(O/F') Find the probability that the die comes up odd given that a 5 is not rolled.

Q3. [04+06]

a. An employer wishes to hire three people from a group of 15 applicants (8 men and 7 women), all of whom are equally qualified to fill the position. If he selects the three at random, what is the probability that
i. all three will be men,
ii. at least one will be a women?

b. Given the probability function.

$$P(x) = \frac{(5-x)}{10} \quad \text{for } x = 1, 2, 3, 4$$

Calculate the mean and variance of x. Comment on the shape of the probability distribution.

Q4. [05+05]

a. Out of 100 cadets selected, 40 already know swimming and thus will not require a two week swimming course of beginners. What will be the probability that out of 35 cadets selected, 7 will get exemption from swimming course for the beginners?

b. The average number of times, a naval vessel calls for external help for its signaling systems repairs during a year is 4. What is the probability that external help will be sought?
i. What is the probability that external help will be sought 6 times in a given year?
ii. More than 5 times in a given year?

Q5. [12]

a. Write briefly the properties of the correlation coefficient, interpret the meaning when r = -1, 0, +1.

b. The marketing manager of a large supermarket chain would like to determine the effect of shelf space on the sales of pet food. A random sample of 12 equal-sized stores is selected, with the following results:

Stores	Shelf Space X (feet)	Weekly Sales (Hundred of Do...
1	5	1.6
2	5	2.2
3	5	1.4
4	10	1.9
5	10	2.4
6	10	2.6
7	15	2.3
8	15	2.7
9	15	2.8
10	20	2.6
11	20	2.9
12	20	3.1

i.   Set up a scatter diagram.
ii. Calculate the correlation coefficient (r).
iii. Assume a linear relationship, use the least square method to find the regression coefficients a and b.
iv. Interpret the meaning of the slope in this problem.
v.   Predict the average weekly sales (in hundreds of dollars) of pet food for stores with 8 feet of shelf space for pet food.

Q6.   [04+04]
a.   What are index numbers? State their limitations. Why index numbers are called Economic barometers of a country?

b.   Calculate the price index using weighted aggregative index.

Commodity	Quantity Units	Prices 2005	Prices 2008
A	7	321	581
B	8	54	67
C	4	224	305

Date: June 23, 2009

Max Marks: 60
Max Time: 3 Hours

Note: a) Attempt any 06 questions in the given sequence in your answer script.
b) Marks of each question are mentioned in square brackets.

Question # 01(a) [04]
Distinguish between ungroup and group data; also explain which type of data is easier to interpret?

Question # 01(b) [06]
A retail store manager has selected a sample of sales slips during the past month and now needs your assistance in answering some questions about the sample. The 64 sales values have been numerically ordered as follows:

$0.97	$1.23	$1.29	$1.69	$2.19	$2.77	$3.19	$3.57	3.97	3.99	4.35
4.44	4.44	4.50	4.65	5.25	5.69	5.99	6.49	6.50	6.99	7.19
7.44	7.49	7.75	8.12	8.90	8.99	9.85	9.97	9.97	9.98	10.48
11.97	11.99	11.99	11.99	12.49	12.95	13.39	13.88	13.89	14.99	16.30
18.63	19.97	21.25	21.50	22.95	23.85	24.99	24.99	29.97	34.95	34.98
35.95	41.69	49.99	61.98	64.38	67.29	68.99	69.99	74.96		

a. What is the mean sales level for the 64 sales values? What is the median sales level for these data? What is the mode? (you may group the data).
b. Determine Pearson coefficient of skewness and note that the median and mode are fairly close but that the mean is much larger. Why is this?

Question # 02 [10]
a) A sample of $n = 8$ scores has a mean of 11. After one new score is added to the sample, the new mean is 12. What is the value of the new score?

b) Explain why it is difficult to determine mode, GM and HM from the following data:
$$3, \quad -11, \quad 0, \quad 63, \quad -148, \quad 400$$
Which measure of central tendency is most suitable in above case?

c) In a recent survey comparing picture quality for three brands of color televisions, 63 people preferred brand A, 29 people preferred brand B, and 58 people preferred brand C. Calculate the appropriate measure of central tendency for this distribution of data?

Question # 03(a) [04]
Distinguish among Classical and Empirical (or Relative frequency) probability. What are their disadvantages?

Question # 03(b) [06]
Determine the probability 'p', or an estimate of it, for each of the following events:
a) A king, ace, jack of clubs, or queen of diamonds appears in drawing a single card from a well-shuffled ordinary deck of cards.
b) The sum of 8 appears in a single toss of a pair of fair dice
c) A non-defective bolt will be found if out of 600 bolts already examined, 12 were defective.

Question # 04(a) [05]
Consider the pop quiz consisting of three questions with 4 options in a multiple choice questionnaire, and suppose that the student blindly guesses the answers. Then find the probability using laws of probability that:

a) The student will get exactly two questions correct.
b) The student will get at least one question correct.
c) Verify your answer obtained in part a) and b) by using appropriate probability distribution that can best fit to this situation.

The following table reflects data that have been collected on a store's customers:

age	Male	Female
under 20	160	208
20 - 40	340	290
over 40	170	160

a. Using the relative frequency of occurrence approach, what is the probability that a customer is a male?
b. What is the probability that a customer is 20–40 years old?
c. What is the joint probability of a customer being 20–40 years old and a male?

What is a random variable? Define discrete and continuous random variables with atleast one example.

Du pont International is a multinational company. The company employs eighty people for a particular task. Suppose employee is selected at random, let x denotes the monthly salary of the employee obtained;

Salary x (in '00)	Probability $P(x)$
240	0.375
320	0.250
450	0.125
600	0.250

a) Plot the Probability distribution in your scripts
b) Find the expected value and standard deviation of the random variable x.
c) Make two or three lines comments on the shape and results obtained.

a) What are Index Numbers?

b) The prices and quantities of three products during the years 2000 and 2006 are given below.

Products	2000		2006	
	Unit price	Quantity	Unit price	Quantity
	P_o	q_o	P_n	q_n
A	2.50	25	3	30
B	4.50	10	6.00	8
C	0.60	10	0.84	15

i. Compute a Laspeyres price index number for the year 2006 with 2000 as the base.
ii. Compute a Paasche price index number for the year 2006 with 2000 as the base.

Following table shows the marks in two quizzes in Statistics class of 10 students;

Quiz 1	6	5	8	8	7	6	10	4	9	7
Quiz 2	8	7	7	10	5	8	10	6	8	6

a) Construct a neat scatter diagram in your scripts
b) Find the correlation coefficient.
c) Find the least square regression line of Y on X.
d) Using the regression model, estimate marks of 2nd Quiz of a student who got 3 marks in the 1st one.

Have a Nice Exam ☺

UNIVERSITY OF KARACHI
KARACHI UNIVERSITY BUSINESS SCHOOL
Final Examination: Affiliated Colleges
BUSINESS STATISTICS – BA(M) – 532
MBA – II

Obaid

Time: 3 Hours　　　　**Date: January 11, 2009**　　　　**Max. Marks: 60**

Instruction: (i) Attempt any FIVE (5) questions (ii) All questions carry equal marks.

Q.1(a) Differentiate between:
  (i) Descriptive and Inferential Statistics.
  (ii) Primary and Secondary data.

  (b) Prepare a frequency distribution for the following data taking suitable number of equal classes. Draw Histogram and Frequency Polygon of this distribution on the same paper.

3.1	10.3	3.9	0.5	1.5	11.2	15.6	1.8	12.8	8.2	7.7	2.9
3.4	11.6	6.4	3.5	8.5	8.4	0.7	7.2	6.8	10.2	0.9	5.5

Q.2(a) The daily sales in a hardware store are as follows:
  Rs. 136, 484, 2837, 265, 195, 176 and 572.
  (i) Calculate mean and median for these sales data.
  (ii) Which one gives a meaningful measure of average and why?

  (b) The elevator in a hospital is designed to carry a maximum load of 2000 kg.
  Is it over loaded if at one time it carries
  (i) 24 passengers whose mean weight is 84 kg?
  (ii) 9 women whose mean weight is 71 kg and 12 men whose mean weight is 86 kg?

  (c) In a class there are 22 girls and 38 boys. The mean score of girls in an examination is 78 and the mean score of boys is 71. What is the mean score of the entire class?

Q.3(a) For the frequency distribution given below, determine the proportion of values in the intervals $(\mu \pm \sigma)$ where μ is the mean and σ is the standard deviation of the distribution.

C.I	f
8.0 – 8.9	14
9.0 – 9.9	27
10.0 – 10.9	22
11.0 – 11.9	5
12.0 – 12.9	4
13.0 – 13.9	12
14.0 – 14.9	16

Please Turn Over

Date : January 15, 2008
Max. Marks : 60

Time : 3 Hours

Instructions: 1. Attempt any five (5) questions.

Q.No.1. a) Differentiate between Descriptive and Inferential Statistics. (4)

b) The daily sales in a hardware store are as follows: (8)
Rs. 136, 484, 2837, 265, 195, 176 and 572.

    (i) Calculate Mean and Median for these sales data.
    (ii) Which one gives a meaningful measure of average and why?

Q.No.2. For the frequency distribution given below: (12)

Class	Frequency
8.0 — 8.9	14
9.0 — 9.9	27
10.0 — 10.9	22
11.0 — 11.9	5
12.0 — 12.9	4
13.0 — 13.9	12
14.0 — 14.9	16

    (i) Compute Mean μ and standard deviation σ.
    (ii) Determine proportion of values in the interval $(\mu \pm \sigma)$.

Q.No.3. Consider the following data on the number of hours which 10 persons studied for an (12)
English test and their scores on the test:

Hours studied (x)	4	9	10	14	4	7	12	22	1	17
Test scores (y)	31	58	65	73	37	44	60	91	21	84

    (i) Determine the regression equation of y on x.
    (ii) Calculate the coefficient of determination and interpret.

Q.No.4 a) A candidate is contesting for both National and Provisional Assembly seats. The (6)
probability that he will win the national seat is 0.8 and he will with provisional seat
is 0.6. What is the probability that he will win at least one seat if the two results
are independent?

b) Two balanced dice are rolled. What is the probability that (6)
    (i) the sum of dots is at most 8?
    (ii) The product of dots is 10 or less?

Q.No.5. a) A fair coin is tossed 5 times. Let the random variable x is the "number of heads". (6)
Find (i), probability distribution of x.
    (ii) expected value of x.

b) Three items are chosen at random from a lot containing 15 items of which 6 are (6)
defective. Find the probability that at least two items are defective.

Q.No.6. a) What is Consumer Price Index and how it is constructed? (4)
b) For the data given below: (8)

Commodity	Rice		Wheat	
Year	Price	Quantity	Price	Quantity
2005	40	100	20	60
2006	55	90	35	75

Calculate Fisher's Price Index for 2006.

Instructions:
1. **Attempt all questions in sequence/ all questions carry equal marks.**
2. **Exchange of stationary items/calculators & use of Mobile Phone is strictly prohibited.**

Dated: Dec 31, 2005   Time: 180 Minutes   Max. Marks: 60

Q-1(a). Answer any Three.
   (i) How can you broadly classify data with respect to the source.
   (ii) Importance of Statistics in Business Organizations.
   (iii) Differentiate between Simple random sampling and stratified random sampling
   (iv) Differentiate between Histogram and Bar chart
   (v) Differentiate between Statistics and Probability

(b) Given below is the data of the number of micro hydropower located in various   cities of Pakistan (as on July 2002)

Micro Hydropower Locations

Abbotabad	7
Bunair	14
Chitral	26
Dir	21
Kohistan	39
Manschra	17
Northern Areas	17
Swat	41
Shangla	64
Others	21
Total	267

(Source: Ministry of science of Technology, 2002)

Which statistical tool is most preferable to view the distribution in this case? Show   the illustration of the assumed statistical tool you have employed & conclude your result about the type of distribution.

Q-1(c) Consider the data showing some items from a human resource database representing the status of five people as on July 20, 2005.

Gender	Salary (Rs)	Education	Year of experience
M	42,300	MBA	9
F	15,800	B.Com	4
M	29,500	MBA	3
F	58,100	M. Phil	15
M	86,000	PhD	6

   i.   What kind of data set is this?
   ii.   Which of these four variables are quantitative or qualitative?Why
   iii. Which variable, if any, are ordinal or nominal? Why?
   iv.   Is this time series or cross sectional data? Why?

Q.2(a) A large recreational facility has three entrances. According to automatic vehicles counters, last year 11,976 vehicles entered the first entrance, 24,205 at the second and 7474 at the third. A survey done at each entrance showed that the average planned length of stay was 3.5 days at the first location, 1.3 days at the second and 6.0 at the third. Estimate the typical planned length of stay for the entire facility on a per vehicle basis.

(b) The following is a hypothetical data:

Y= consumption of chicken meat per capita in Kgs

X= Disposable income per capita in Pak. Rupees.

X:	1	2	4	5	8	10
Y:	20	22	25	30	33	38

Determine the correlation coefficient between X and Y and also comment on your result.

Q.3.

Consider the quality of cars as measured by the number of cars requiring extra work after assembly in each day's production for 15 days:

$$30, 34, 9, 14, 28, 9, 23, 0, 5, 23; 25, 7, 0, 3, 24$$

a) Find the average number of defects per day.
b) Find the median number of defects per day.
c) Draw a histogram of the data
d) Find the mode number of defects per day for your histogram in part c.
e) Find the quartiles
f) Find the extremes (Range)
g) Draw a box plot of the data

Q.4(a) Differentiate between:
- Dependent and independent Events
- Mutually Exclusive and Non-Mutually Exclusive Events

Q.4(b) The probability of a blown fuse is 6% and the probability of a broken wire is 4% and the probability of "blown fuse and broken wire" is 1%.
(i) Compute the conditional probability of a broken wire given a blown fuse.
(ii) Draw Venn diagram for both the situation of unconditional and conditional probability.

Q.4(c) In an institution there are 25 men and 10 women; how many committees can be formed each consisting of 5 men and 3 women

Q.5 (a) Define mathematical Expectation of a Random variable

(b) There are four projects being considered and the payoff for the four options are modeled as a discrete distribution with probability distribution as follows:

Payoff (Rs. 000)	Probability
0	0.50
10	0.25
20	0.15
30	0.10

i. Find the expected value of the option payoff.
ii. Describe what this expected value represents.
iii. Find the standard deviation of the option payoff.
iv. Find the probability that the option will pay atleast Rs.20.

Q.6 (a) Define Poisson distribution.

(b) The quality of your firm's product is very high and you expect only 1.3 of your products to be returned, on average, each day for warranty repairs. Comment on the type of distribution. What are the chances that no products will be returned tomorrow? That one will be returned? How about two? How about three?

Q1(a) (i) Define discrete variables with atleast three examples.

(ii) The Federal Bureau of Statistics collects the data on household size and publish the information in current population report. What kind of data is the number of people in your household and what is the variable?

(b) Explain the difference between the following terms:
- **(i)** Statistics (as singular sense) and Statistics (as plural sense).
- **(ii)** Qualitative and Quantitative data.
- **(iii)** Histogram and Bar chart.

Q2. The final marks in business statistics of 60 students are given below:
61,69,57,59,70,65,62,57,75,63,59,57,62,60,73,85,75,61,67,69,51,56,54,64,77,95,86,
68,69,50,64,56,69,61,73,74,71,67,58,60,51,58,89,92,97,89,68,93,69,59,76,52,75,67,64,99
58,63,65,64.

Construct a frequency distribution and comment on the shape of distribution by constructing a histogram.

Q3(a) Consider the ages (in years) of employees in an organization:
37,36,24,28,43,44,36,41,27,33,30,24.
- **(i)** Determine mean, median and mode.
- **(ii)** Find the Ist quartile.

(b) ABC, an independent testing agency, tested the life times of two bulbs. Light bulb is defined as the number of hours a bulb will operate continuously before it burn out. The results of tests on seven bulbs of each brand are as follows:

BRAND A	10.5	9.1	10	10.3	9.4	9.6	9.7
BRAND B	11.3	7	9.7	9.6	10.5	11.8	8.7

- **(i)** Compute the sample standard deviation for each data set.
- **(ii)** Which data set appears to have less variation?
- **(iii)** Find coefficient of variation for each brand and interpret them.

Q4(a) What is Binomial distribution and in which situation it is appropriate to use?

The probability that an entering college student will graduate is 0.4. Determine the probability that out of 5 students:
- **(i)** none,
- **(ii)** at least one, &
- **(iii)** all will graduate.

(b) The number of customers arriving per hour at a certain automobile service facility is assumed to follow a Poisson distribution with mean $\lambda = 7$.
- **(i)** Compute the probability that more than 10 customers will arrive in a 2-hour period.
- **(ii)** What is the mean number of arrivals during a 2-hour period?

Q5(a) The random variable X is the grade level of a secondary school student selected at random. Its probability distribution is as follows:

x	9	10	11	12
P(X=x)	0.301	0.262	0.23	0.208

    (i) Determine mean and variance of random variable.
    (ii) What is $P(x < 11)$.,

(b) In a high school graduating class of 100 students, 54 studied mathematics, 69 studied statistics and 35 studied both mathematics & statistics. If one of these student is selected at random, find the probability that:
    (i) The student took mathematics or statistics.
    (ii) The student took statistics but not mathematics.

Q6(a) Differentiate between correlation and regression give an example.

(b) A study was made by a retail merchant to determine the relation between weekly advertising expenditures and sales. The following data were recorded:

Advertising costs($) x	Sales($) y
40	- 385
20	400
25	- 395
20	365
30	475
50	440
40	490
20	420
50	560
40	525
25	480
50	510

    (i) Plot a scatter diagram
    (ii) Find the regression equation to predict weekly sales from advertising expenditures.
    (iii) Estimate the weekly sales when advertising costs are $35.
    (iv) Find correlation coefficient r and interpret the result.

Q7(a) Define Index number. Write its uses. Differentiate between simple and composite index numbers.

(b) Calculate the unweighted aggregative price indices for 1986,1987, and 1988.

Commodities

Year	A	B	C	D	E
1985(P0)	47	23	24	25	81
1986(P1)	51	23	40	28	84
1987(P2)	60	24	56	28	90
1988(P3)	62	26	72	29	99

Instructions:
1. Attempt any FIVE questions in sequence/ all questions carry equal marks.
2. Exchange of stationary items/calculators & use of Mobile Phone is strictly prohibited.

Dated: June 25 2008   Time: 180 Minutes   Max. Marks: 60

Q-1(a). Answer any Three.
    (i) How can you broadly classify data with respect to the source.
    (ii) Importance of Statistics in Business Organizations.
    (iii) Differentiate between Primary data and secondary data
    (iv) Differentiate between Histogram and Bar chart
    (v) Differentiate between Statistics and Probability

(b) Given below is the data of the number of micro hydropower located in various cities of Pakistan

Micro Hydropower Locations	
Abbotabad	7
Bunair	14
Chitral	26
Dir	21
Kohistan	39
Mansehra	17
Northern Areas	17
Swat	41
Shangla	64
Others	21
Total	267

Which statistical tool is most preferable to view the distribution in this case? Show the illustration of the assumed statistical tool you have employed & conclude your result about the type of distribution.

Q-1(c) Consider the data showing some items from a human resource database representing the status of five people as on July 20, 2005.

Gender	Salary (Rs)	Education	Year of experience
M	42,300	MBA	9
F	15,800	B.Com	4
M	29,500	MBA	3
F	58,100	M. Phil	15
M	86,000	PhD	6

i.   What kind of data set is this?
ii.   Which of these four variables are quantitative or qualitative? Why?
iii.   Which variable, if any, are ordinal or nominal? Why?
iv.   Is this time series or cross sectional data?

Q.2(a) A large recreational facility has three entrances. According to automatic vehicles counters, last year 11,976 vehicles entered the first entrance, 24,205 at the second and 7474 at the third. A survey done at each entrance showed that the average planned length of stay was 3.5 days at the first location, 1.3 days at the second and 6.0 at the third Estimate the ... length of stay for the entire facility on a per vehicle basis.

Q.2(b) The following is a hypothetical data:

Y = consumption of chicken meat per capita in Kgs

X = Disposable income per capita in Pak. Rupees.

X:	1	2	4	5	8	10
Y:	20	22	25	30	33	38

Determine the correlation coefficient between X and Y and also comment on your result.

Q.3.

Consider the quality of cars as measured by the number of cars requiring extra work after assembly in each day's production for 15 days:

30, 34, 6, 14, 28, 6, 13, 6, 7, 13, 25, 1, 9, 3, 14

a) Find the average number of defects per day.
b) Find the median number of defects per day.
c) Draw a histogram of the data
d) Find the mode number of defects per day for your histogram in part c.
e) Find the quartiles
f) Find the extremes (Range)
g) Draw a box plot of the data

Q.4(a) Differentiate between:

- Dependent and independent Events
- Mutually Exclusive and Non-Mutually Exclusive Events

Q.4(b) The probability of a blown fuse is 6% and the probability of a broken wire is 4% and the probability of "blown fuse and broken wire" is 1%.
(i) Compute the conditional probability of a broken wire given a blown fuse.
(ii) Draw Venn diagram for both the situation of unconditional and conditional probability.

Q.4(c) In an institution there are 25 men and 10 women; how many committees can be formed each consisting of 5 men and 3 women

Q.5 (a) Define mathematical Expectation of a Random variable
(b) There are four projects being considered and the payoffs for the four options are modeled as a discrete distribution with probability distribution as follows:

Payoff (Rs. 000)	Probability
0	0.50
10	0.25
20	0.15
30	0.10

i. Find the expected value of the option payoff.
ii. Describe what this expected value represents.
iii. Find the standard deviation of the option payoff.
iv. Find the probability that the option will pay atleast Rs.20.

Q.6 (a) Define Poisson distribution.
(b) The quality of your firm's product is very high and you expect only 1.3 of your products to be returned, on average, each day for warranty repairs. Comment on the type of distribution. What are the chances that no products will be returned tomorrow? That one will be returned? How about two? How about three?