



**PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF MANAGEMENT**

Max Marks: 100

Max Time: 3 Hours

Weightage: 40 %

Set B

COMPREHENSIVE EXAMINATION

I Semester 2016-
2017

Course: **MBA A 207 Management science**

12 December 2015

Instructions: Scientific and non- programmable calculators are permitted

PART A

(10 Q x 2 M= 20 Marks)

1. Name one measure of central tendency which is NOT influenced by outliers.
2. Define standard deviation. List the formula for sample standard deviation
3. What is the range of values that coefficient of determination (R^2) can take?
4. What do we use scatterplots for?
5. What does a negative coefficient of correlation indicate?
6. List one disadvantage of using covariance as a measure of association?
7. Define a population.
8. What is time-series data? Give an example
9. What is Nominal data .Give an example
10. What are quartiles?

PART B

(8 Q x 5 M= 40 Marks)

1. In the following stem-and-leaf display for a set of two-digit integers, the stem is the 10's digit, and each leaf is the 1's digit.

2|007789

3|013457

4|1234

5|08

- a. Construct the original set of data
 - b. Construct a frequency table
2. ABC retail has introduced a new line of clothing the past year. A regression model between the sales (in units) and unit price (X_1 in Rupees) and television advertisement (X_2 in Rupees) resulted in the following function:

$$\hat{Y} = 9 - 3X_1 + 5X_2 \text{ with } R^2 = 0.52$$

- a. Interpret the coefficient of X_1
- b. Interpret the coefficient of X_2
- c. Interpret the intercept in this equation
- d. Predict sales when the price is Rs100 and advertisement expense is Rs5000
- e. Can you suggest some additional variables relevant to this business context which can improve the R^2

3. Listed below are two sample data sets, P and Q. Calculate the mean and sample Standard deviation for both.

- a. Data Set X: 7, 8, 9, 10, 11
- b. Data Set Y: -9, 0, 9, 18, 27

4. The hourly wages of a sample of 130 system analysts are given below.

mean = 60	range = 20
mode = 73	variance = 324
median = 74	

- a. Calculate the standard deviation
- b. Calculate coefficient of variation

5. Below you are given a partial excel output based on a sample of 25 observations.

	Coefficient
Constant	58.24
X1	85.62
X2	-9.72
X3	0.72

- a. Construct the regression equation based on the output above
 - b. Interpret the coefficient of X_1
 - c. Interpret the coefficient of X_2
 - d. Interpret the coefficient of X_3
 - e. What does the 'constant' value signify in the equation
6. Mercom advertising is interested in buying effective TV commercial slots so that their ads would reach the appropriate target group. Their analysts collected data on the hours of television watched in a day and the age of a person. A sample is given below.

Hours of Television	Age
1	45
3	30
4	22
3	25
6	5

- Determine which variable is the dependent variable.
 - Compute the least squares estimated line.
7. Find the Economic Order Quantity (EOQ) for the given data

Annual Demand Quantity: 8000,000 Tonnes/Year
 Fixed Cost Per Order: ₹ 700 /Ton/Year
 Annual Holding Cost: ₹ 15/Ton/Year

8. A new shopping mall is considering setting up an information desk manned by one employee. Based upon information obtained from similar information desks, it is believed that people will arrive at the desk at a rate of 30 per hour. It takes an average of 1 minute to answer a question. It is assumed that the arrivals follow a Poisson distribution and answer times are exponentially distributed.
- Find the probability that the employee is idle
 - Find the proportion of the time that the employee is busy
 - Find the average number of people receiving and waiting to receive some information.
 - Find the average number of people waiting in line to get some information.
 - Find the average time a person seeking information spends in the system

PART C

(2 Q x 20 M= 40 Marks)

1. From the below mentioned table construct a network diagram and find the following:

- Duration of Critical Path
- Float For Activity E
- Float For Activity F
- Float For Activity G

Activity	Immediate Predecessor	Time in Days
A	-	3
B	A	4
C	A	2
D	B	5
E	C	1
F	C	2
G	D,E	4
H	F,G	3

2. The following sample data contains the number of years of college and the current annual salary for a random sample of heavy equipment salespeople.

Years of College	Annual Income (In Thousands)
2	20
2	23
3	25
4	26
3	28
1	29
4	27
3	30
4	33
4	35

- Which variable is the dependent variable? Which is the independent variable?
- Determine the least squares estimated regression line.
- Predict the annual income of a salesperson with one year of college.
- What is the error between predicted income (with one year of college) and the actual data
- Calculate the sample correlation coefficient between income and years of college. Interpret the value you obtain.



PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF MANAGEMENT

Max Marks: 80

Max Time: 2 Hours

Weightage: 20 %

Set A

MID TERM EXAMINATION

I Semester 2016-
2017

Course: **MBA A 207 Management science**

07 October 2015

Instructions: Scientific and non-programmable calculators are permitted

Part A

(10 Q x 2 M= 20 Marks)

Answer the following questions

1. What is a symmetric distribution? Specify characteristics of SD in terms of measures of central tendency
2. Broadly what are the two types of data? Give an example for each.
3. Define the concept of 'population' as used in statistics and provide an example to support your answer
4. What is the use of stem and leaf display? Under what conditions can it be used?
5. What are the chart types that help us to understand the distribution of data?
6. What are 'Time-series' data. Support your answer with an example.
7. Define Mode. In what situation is median relevant as a measure of central tendency?
8. What is a percentile? State at least one real-life application of percentiles
9. Define Interquartile range .In what context is IQR a relevant measure?
10. Define coefficient of variation. List the formula for calculating it.

Part B

Answer the following questions

(6 Q x 5 M= 30 Marks)

1. Listed below are two sample data sets, S and T. Which data set has the larger standard deviation?
 - a. Data Set S: 1, 5, 3, 5, 5, 6, 7, 8, 3
 - b. Data Set T: 8, 3, 3, 3, 10, 11, 11, 15
2. An organization chooses to analyse the relationship between sales productivity of an employee and various other factors (specific to the employee). The table below describes some variables that are of interest

ID	Gender	Prior experience	Salary/month	Highest level of education	Number of promotions within organization
1111	1	N	24000	High school	3
2222	1	Y	33000	Masters	2
3333	2	Y	29000	Bachelors	2
4444	2	N	37000	Doctorate	2
5555	1	Y	20000	Diploma	1

- What is the variable-type for the variable 'Gender'?
- What is the variable-type for the variable 'Prior Work Experience'?
- What is the variable-type for the variable 'salary'?
- What is the variable-type for the variable 'Highest level of education'?
- What is the variable-type for the variable 'Number of Promotions'?

3. Samples were obtained from street vendors selling Vegetable rolls around the university

Vendor Length of vegetable roll (inches)

Shyam	5,5,5,5,5
Ram	6,5,5,5,4
Prem	9,9,5,1,1
Muni	9,5,5,5,1
Rahul	4,5,3,3,7,8
Raj	9,9,9,4,4,3,3,3,3

- For each of the samples listed below obtain Mean and Standard deviation.
 - Given that the price per roll is the same across all vendors which vendor would you buy from. Explain your logic.
4. In a frequency distribution of 250 scores, the mean is reported to be 78 and the median is 65.
- Show with a diagram how the distribution would be shaped
 - What would you call such a distribution. Give reasons for your conclusion
5. Sheldon and Leonard are workers in a motor part manufacturing unit. Their jobs are identical. Data collected on their work performance over a long period of time reveals the following

	Sheldon	Leonard
Mean time of completing the job (minutes)	30	25
Standard deviation (minutes)	6	4

- Which worker appears to be more consistent in completing the job? Explain.
- Which worker appears to be faster in completing the job? Explain.

6. In the following stem-and-leaf display for a set of two-digit integers, the stem is the 10's digit, and each leaf is the 1's digit.

2|002278

3|011359

4|1344

5|47

- Construct the original set of data
- Construct a frequency table

Part C

(2 Q x 15 M= 30 Marks)

1. The operations manager of a plant that manufactures tires wants to compare the actual inner diameters of two grades of tires, each of which is expected to be 575 millimeters. A sample of five tires of each grade was selected, and the results representing the inner diameters of the tires, ranked from smallest to largest, are as follows:

GRADE X	568	570	575	578	584
GRADE Y	573	574	575	577	578

- For each of the two grades of tires, compute the mean, median, and standard deviation.
 - Find the quartiles
 - Construct a Box and whiskers
 - Which grade of tire is providing better quality? Explain
2. A bank branch located in a commercial district of a city has the business objective of developing an improved process for serving customers during the noon-to-1:00 P.M. lunch period. The waiting time, in minutes, is defined as the time the customer enters the line to when he or she reaches the teller window. Data are collected from a sample of 15 customers during this hour. The table below has the observations

4.21	5.55	3.02	5.13	4.77
2.34	3.54	3.20	4.50	6.10
0.38	5.12	6.46	6.19	3.79

- Compute the mean and median
- Compute the variance, standard deviation, range
- Are there any outliers? Explain.
- Is the data skewed? If so how?