



**PRESIDENCY UNIVERSITY,
BENGALURU**

SCHOOL OF MANAGEMENT

SET A

MID TERM EXAMINATION

Odd Semester: 2018-19

Date: 29 October 2018

Course Code: MGT 103

Time: 2 Hours

Course Name: Business Statistics

Max Marks: 40

Branch & Sem: MBA & I Sem

Weightage: 20%

Instructions:

- (i) *Non-Programmable calculators are allowed.*
- (ii) *Answers should preferably be straight and not circuitous.*

Part A

Answer **all** the Questions. **Each** question carries **three** marks. (4x3=12)

1. Write down formula for Standard Deviation. Write at least two analytical implications of Co-efficient of Variation.
2. Give three strong reasons for employing median for decision making.
3. To analyse the income of the Male and Female, what type of scale of measurement would you use. Give at least two reasons for your answer.
4. The mean age group of men and women is 30 years. If the mean age of the group of men is 32 and that of the group of women is 27, find out the percentage of men and women in the group.

Part B

Answer **all** the Questions. **Each** question carries **Six** marks. (3x4=12)

5. Construct relative frequency distributions and percentage distributions for the following:

MEAL COST Rs.	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90- 100	TOTAL
FREQUENCY	3	7	13	14	7	1	3	2	50

6. Exemplify any four merits of Histogram.

7. Find Arithmetic Mean for the data related to the monthly sales of 200 companies as given below:

Sales (Rs. In Lakhs)	300-350	350-400	400-450	450-500	500-550	550-600	600-650	650-700	700-750
No. of companies	5	14	23	50	52	25	22	7	2

Part C

Answer **all** the Questions. **Each** Question carries **Eight** marks. (2x8=16)

8. Determine and analyse the first, second and third quartiles of the following data:

10.5	14.7	15.3	17.7	15.9	12.2	10	14.1	13.9	18.5	13.9	15.1	14.7
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9. Nutritional data about a sample of seven varieties of cereals includes the number of calories per serving are as follows:

Variety of cereal	A	B	C	D	E	F	G
Calories	80	100	100	110	130	190	200

Compute Standard Deviation (SD).



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Instructions:

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 (ii) Graph papers will be provided on request.

Part A

Answer **all** the Questions. **Each** question carries **three** marks.

(4x3=12)

1. Define qualitative variable. Give an example.
2. Mention the merits of median.
3. Define ratio scale. Give an example.
4. Compute range for the following data:
 239 346 109 444 563 144 253 492.

Part B

Answer **all** the Questions. **Each** question carries **four** marks.

(3x4=12)

5. The following are the marks scored by students in an examination. Find the mean.

Marks :	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Students :	5	15	21	15	12	8	3	1
6. The following data represent the number of automobiles arriving at a toll booth during 20 intervals, each of 10 minutes duration. Compute the median.

26	26	58	24	22	22	15	33	19	27
21	18	16	20	34	25	27	30	31	33
7. Draw the histogram for the following data and locate the mode.

Height (in inches)	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11
No. of saplings	3	7	12	16	22	20	13	7

Part C

Answer **all** the Question. Each Question carries **eight** marks.

(2x8=16)

8. The number of telephone calls received in 245 successive one-minute intervals at an exchange are shown in the following frequency distribution. Calculate Q_1 , Q_3 and P_{42}

No of calls	:	0	1	2	3	4	5	6	7
No of intervals	:	14	21	25	43	51	40	39	12

9. The 2000 U.S. Census asked for each person's age. Suppose that a sample of 20 households taken from the census data showed the age of the first person recorded on the census form to be as follows.

42	29	31	38	55	27	28	33	49	70
25	21	38	47	63	22	38	52	50	41

Compute coefficient of variation.



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Time: 2 Hours

Course Name: Business Statistics

Max Marks: 40

Branch & Sem: MBA & I Sem

Weightage: 20%

Instructions:

- (i) Students are permitted to use scientific calculators
- (ii) Graph papers will be provided on request.
- (iii)

Part A

Answer **all** the Questions. **Each** question carries **three** marks. (4x3=12)

1. Mention any four uses of statistics for Managers.
2. Mention four different scales of variables used in statistics.
3. Distinguish between, sample and population, statistic and parameter.
4. Rearrange the Following data in the array form. Find the range
239 346 109 444 563 144 253 492, 104, 204, 322, 895, 905, 448, 506.

Part B

Answer **all** the Questions. **Each** question carries **four** marks. (3x4=12)

5. Weekly salary distribution of supervisors in a company is given below. The total salary of the three supervisors in the group 2800 and above is known to be equal to Rs 12600. Find the mean weekly salary of the supervisors. Also compute the midpoint for the class 2800 and above.

Weekly Salary in Rupees Class -interval	No. of supervisors Frequency
2400-2450	3
2450 - 2500	8
2500-2600	12
2600-2700	10
2700-2800	14
2800 and above	3

6. The following data represent the distribution of sample 100 companies according to the profits earned by them in the last year. Find graphically the median profit from this data using ascending and descending ogive curves.

Profit in lakhs of Rs Class interval	No. of companies frequency
0-20	8
20-40	15
40-50	36
60-80	22
80-100	12
100-120	7

7. Find Mode the for the following distribution table, either using formula or graphically using the Histogram

Salary in Rs Thousands Class interval	No. of graduates Frequency
40-50	6
50-60	18
60-70	30
70-80	24
80-90	18
90-100	15
100-120	9

Part C

Answer **all** the Question. Each Question carries **eight** marks.

(2x8=16)

8. The data set in the form of array for the number of alcoholic deaths in USA in the year 2005 for 51 states given as an array is shown below.

Array of No. of alcoholic deaths,

20	30	50	60	80	120	150	170	230	260	310	360	420	460	510	540	1470
20	40	60	70	90	120	150	180	230	280	320	370	420	490	520	580	1560
30	50	60	80	110	120	170	200	240	290	340	390	460	500	540	630	1710

Draw a stem and leaf display for the above data and find the range .

9. The Rice purchasing pattern for three successive months of two families A and B are as follows;

Family A purchases 10kgs of rice in January, at a price of Rs 50, 9 kgs of rice at a price of Rs 55 in February, and 12 kgs of rice at a price of Rs 45 per kg in March. Family B buys rice in January for an amount of Rs 600 at a rate of Rs 50, in February again for Rs 600 at a price of Rs 45 per kg and in March also buys rice for Rs 600 at a rate of Rs 45 per kg. Find the average buying price of rice for both the families A and B over the three month period.



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Course Name: Business Statistics

Max Marks: 40

Branch & Sem: MBA & I Sem

Weightage: 20%

Instructions:

- (i) Students are permitted to use scientific calculators
 (ii) Graph papers will be provided on request.

Part A

Answer **all** the Questions. **Each** question carries **three** marks. (4x3=12)

1. Explain the terms primary data and secondary data.
2. Give examples for different scales of variables used in statistics.
3. Distinguish between, variables and observation with examples.
4. Rearrange the Following data in the array form. Find the range
 139, 146, 109, 444, 563, 944, 253, 492, 304, 404, 322, 795, 605, 448 and 106.

Part B

Answer **all** the Questions. **Each** question carries **four** marks. (3x4=12)

5. Weekly salary distribution of supervisors in a company is given below. The total salary of the three supervisors in the group 2800 and above is known to be equal to Rs 12600. Find the mean weekly salary of the supervisors. Also compute the frequency x for the class 2450-2500.

Weekly Salary in Rupees Class -interval	No. of supervisors Frequency
2400-2450	3
2450 - 2500	x
2500-2600	12
2600-2700	10
2700-2800	14
2800 and above	3
Total	50

6. The following data represent the distribution of sample 100 companies according to the profits earned by them in the last year. Find graphically the quartiles Q_1 and Q_3 for profit from this data using ascending ogive curve.

Profit in lakhs of Rs Class interval	No. of companies frequency
0-20	8
20-40	15
40-50	36
60-80	22
80-100	12
100-120	7

7. Find Mean the for the following distribution table.

Salary in Rs Thousands Class interval	No. of graduates Frequency
40-50	6
50-60	18
60-70	30
70-80	24
80-90	18
90-100	15
100-120	9

Part C

Answer **all** the Question. Each Question carries **eight** marks.

(2x8=16)

8. The data set in the form of array for the number of alcoholic deaths in USA in the year 2005 for 51 states given as an array is shown below.

Array of No. of alcoholic deaths,

20	30	50	60	80	120	150	170	230	260	310	360	420	460	510	540	1470
20	40	60	70	90	120	150	180	230	280	320	370	420	490	520	580	1560
30	50	60	80	110	120	170	200	240	290	340	390	460	500	540	630	1710

Draw a stem and leaf display for the above data and find the mode

9. The Rice purchasing pattern for three successive months of two families A and B are as follows;

Family A purchases 20 kgs of rice in January, at a price of Rs 50, 18 kgs of rice at a price of Rs 55 in February, and 16 kgs of rice at a price of Rs 45 per kg in March. Family B buys rice in January for an amount of Rs 1600 at a rate of Rs 50, in February again for Rs 1600 at a price of Rs 45 per kg and in March also buys rice for Rs 1600 at a rate of Rs 45 per kg. Find the average buying price of rice for both the families A and B over the three month period.

Roll No.

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END TERM FINAL EXAMINATION

Odd Semester: 2018-19

Date: 09 January 2019

Course Code: MGT 103

Time: 3 Hours

Course Name: Business Statistics

Max Marks: 80

Programme & Sem: MBA & I Sem

Weightage: 40%

Instructions:

- (i) *Students are allowed to use scientific calculators and statistical tables*
- (ii) *Graph sheets will be provided on request*

Part A

Answer **any four** Questions. **Each** question carries **five** marks. (4Qx5M=20)

1. Distinguish between exclusive and inclusive class intervals.
2. The following data represent the afternoon high temperatures for 24 construction days during a year in St. Louis. Construct a stem and leaf plot.
42 70 64 47 66 69 73 38 48 25 55 85
10 24 45 31 62 47 63 84 16 40 81 15
3. A box has 8 white, 10 red and 12 green marbles. Two marbles are randomly drawn from the box. Find the probability that (i) Both are red (ii) Both are green.
4. Define Poisson distribution and provide two examples of a Poisson random variable.
5. Represent the following data using a bar chart.
Year 1965 1975 1985 1995 2005 2015
No of films 360 420 410 595 635 785

Part B

Answer **any three** Questions. **Each** question carries **ten** marks. (3Qx10M=30)

6. The Whitcomb Company manufactures a metal ring for industrial engines that usually weighs about 50 ounces. A random sample of 50 of these metal rings produced the following weights (in ounces).
51 53 56 50 44 47 53 53 42 57 46 55 41
44 52 56 50 57 44 46 41 52 69 53 57 51
54 63 42 47 47 52 53 46 36 58 51 38 49
50 62 39 44 55 43 52 43 42 57 49

Construct a frequency distribution for these data using class interval 35 – 40, 40 – 45 etc. Hence draw the frequency curve.

7. For the following frequency distribution regarding the weights (in pounds) of 100 persons, calculate mean and mode.

Weight	130-140	140-150	150-160	160-170	170-180	180-190
No. of persons	10	20	30	20	10	10

8. A record-store owner assesses customers entering the store as high school age, college age, or older, and finds that of all customers 30%, 50%, and 20%, respectively, fall into these categories. The owner also found that purchases were made by 20% of high school age customers, by 60% of college age customers, and by 80% of older customers. a. What is the probability that a randomly chosen customer entering the store will make a purchase? b. If a randomly chosen customer makes a purchase, what is the probability that this customer is high school age?
9. Compute the mean and variance for the following probability distribution.

x	-2	-1	0	1	2
p(x)	1/5	2/10	2/10	1/5	1/5

Part C

Answer **any two** Questions. **Each** question carries **fifteen** marks. (2Qx15M=30)

10. The following data gives the bounced check fees, in dollars, for a sample of 23 banks for direct deposit customers who maintain a \$100 balance: 26 28 20 20 21 22 25 25 18 25 15 20 18 20 25 25 22 30 30 30 15 20 29. Compute Q1, Q2, Q3 and P70.
11. The following is the frequency distribution of age of 670 students of a school. Compute coefficient of variation.
- | | | | | | | | | | | |
|-----------------|----|----|----|-----|-----|----|----|----|----|----|
| Age (in years) | | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 14 | | | | | | | | | | |
| No. of students | 25 | 45 | 90 | 165 | 112 | 96 | 81 | 26 | 18 | 12 |
12. According to a report by Scarborough Research, the average monthly household cellular phone bill is \$60. Suppose local monthly household cell phone bills are normally distributed with a standard deviation of \$11.35.
- What is the probability that a randomly selected monthly cell phone bill is more than \$85?
 - What is the probability that a randomly selected monthly cell phone bill is between \$45 and \$70?
 - What is the probability that a randomly selected monthly cell phone bill is between \$65 and \$75?
 - 10% of the monthly cell phone bill is exceeded by what amount?

Roll No.

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Instructions:

- (i) *Students are allowed to use scientific calculators and statistical tables*
- (ii) *Graph sheets will be provided on request*

Part A

Answer **any four** Questions. **Each** question carries **five** marks. (4Qx5M=20)

1. A data set lists apartments available for students to rent. Information provided includes the monthly rent, whether or not internet is included free of charge, whether or not pets are allowed, the number of bedrooms, the distance to the campus. Name the variables in the data set and specify whether each variable is categorical or quantitative.
2. Write which scale of measurement is being used in the given scenario.
 - a) A meteorologist compiles a list of temperatures in degrees Celsius for the month of May.
 - b) A film critic lists the top 50 greatest movies of all time.
3. You go to the doctor and she prescribes a medicine for an eye infection that you have. Suppose that the probability of a serious side effect from the medicine is 0.00001. Explain in simple terms what this number means.
4. Consider a binomial experiment with $n = 10$ and $p = 0.10$. Compute $E(x)$ and Variance (x) .
5. What is your favorite colour? A survey of MBA students produced the following summary of responses to that question: blue, 42 per cent; green, 14 per cent; purple, 14 per cent; red, 8 per cent; black, 7 per cent; orange, 5 per cent; yellow, 3 per cent; brown, 3 per cent; gray, 2 per cent; and white, 2 per cent. Make a bar graph of the percentages and write a short summary of the major features of your graph.

Part B

Answer **any three** Questions. **Each** question carries **ten** marks.

(3Qx10M=30)

6. Data below shows the scores on the midterm examination in a business statistics course for 30 students in one section of the course:

80	73	92	85	75	98	93	55	80	90	92	80	87	90	72
65	70	85	83	60	70	90	75	75	58	68	85	78	80	93

- a) Make a histogram of the examination scores using classes 50-59, 60-69 etc.
b) Then use these data to make stem and leaf plot.
c) Compare the histogram with the stem and leaf plot as a way of describing the data distribution. Which one do you prefer for these data?
7. A small accounting firm pays each of its five clerks Rs. 35,000 each, two junior accountants Rs. 80,000 each, and the firm's manager Rs. 320,000 per month.
- a) What is the mean salary paid at this firm?
b) How many of the employees earn less than the mean?
c) What is the median salary?
8. Suppose that we have two events, A and B, with $P(A) = 0.50$, $P(B) = 0.60$, and $P(A \cap B) = 0.40$.
- a) Find $P(A | B)$
b) Find $P(B | A)$
c) Are A and B independent? Why or why not?

9. The following table provides a probability distribution for the random variable x.

X	0	1	2	3	4	5
F(x)	0.18	0.39	0.24	0.14	0.04	0.01

- a) Compute $E(x)$, the expected value of x.
b) Compute σ^2 , the variance of x.

Part C

Answer **any two** Questions. **Each** question carries **fifteen** marks.

(2Qx15M=30)

10. Endowment income is a critical part of the annual budgets at colleges and universities. A study by the National Association of College and University Business Officers reported that the 435 colleges and universities surveyed held a total of \$ 413 billion in endowments. The 10 wealthiest universities are shown below (The Wall Street Journal, 2009).

University	Endowment (\$ billion)	University	Endowment (\$ billion)
Columbia	7.20	Princeton	16.40
Harvard	36.60	Stanford	17.20
M.I.T	10.10	Texas	16.10
Michigan	7.60	Texas A & M	6.70
Northwestern	7.20	Yale	22.90

- a) What is the mean endowment for these universities?
 - b) What is the median endowment?
 - c) What is the mode endowment?
 - d) What is the total endowment at these 10 universities? These universities represent 2.3 per cent of the 435 colleges and universities surveyed. What percentage of the total \$413 billion in endowments is held by these 10 universities?
11. A bowler's scores for six games were 182, 168, 184, 190, 170, and 174. Compute the following descriptive statistics:
- a) Range
 - b) Variance
 - c) Standard Deviation
 - d) Coefficient of Variation
12. A random variable x follows Poisson Distribution with parameter 3, find the probabilities that the variable assumes the values:
- a) 0, 1, 2, 3
 - b) Less than 3
 - c) At least 2

