بسم الله الرحمن الرحيم

STAT 109

PART1

Prepared by

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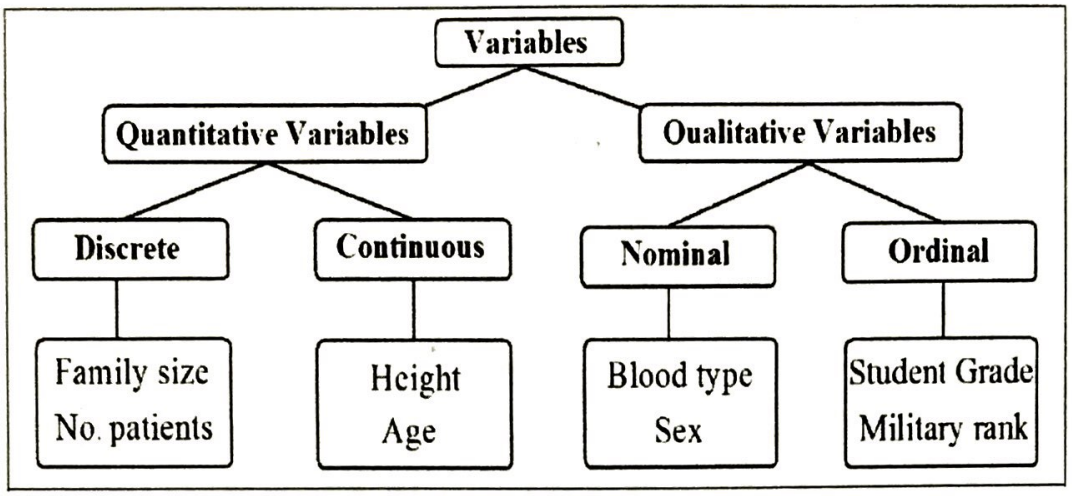
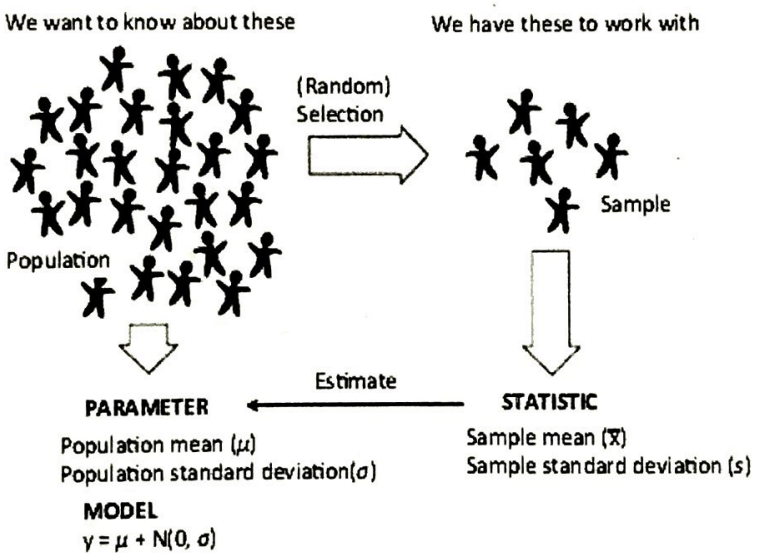


Statistical Inference



Question 1:

Which of the following is an example of a statistic:

A)	the population variance	B)	the sample median	C)	the population mean	D)	the population mode

1. *Which of the following are examples of measures of dispersion:*

A)	the median and the mode	B)	the range and the variance	C)	the parameter and the statistic	D)	the mean and the variance

2. *The number of students admitted in College of Medicine in King Saud University is a variable of type*

(A) Discrete	(B) Qualitative	(C) Continuous	(D) nominal

3. *A mean of a population is called ……*

(A) Parameter	(B) statistic	(C) Median	(D) Mode

4. *The measure that obtained from the population is called*

(A) parameter (B) sample (C) population (D) statistic

5. *The measure that obtained from the sample is called*

(A) parameter (B) sample (C) population (D) statistic

6. *A sample is defined as:*

A) The entire population of values.

B) A measure of reliability of the population.

C) A subset of data selected from a population.

D) Inferential statistics.

Question 2:

From men with age more than 20 years living in Qaseem, we select 200 men. It was found that the average weight of the men was 76 kg.

1) *The variable of interest is:*

(A) Age	(B) weight	(C) 200 men	(D) 76 kg

2) *The sample size is:*

(A) 76	(B) 20	(C) 200	(D) 1520

Question 3:

A study of 250 patients admitted to a hospital during the past year revealed that, on the average (mean), the patients lived 15 miles from the hospital.

1. *The sample in the study is ……..*

(A) 250 patients	*(B) 250 hospitals*	*(C) 250 houses*	*(D) 15 miles*

2. *The population in this study is ……..*

(A) Some patients admitted to the hospital during the past year	*(B) all patients admitted to the hospital during the past year*	*(C) 250 patients admitted to the hospital during the past year*	*(D) 500 patients admitted to the hospital during the past year*

3. *The variable of interest is of type ……..*

(A) continuous	*(B) discrete*	*(C) nominal*	*(D) Qualitative ordinal*

Measure of central tendency	مقاييس النزعة المركزية
$\bar{X} = \frac{\sum_{i=1}^{n} X_i}{n}$	Mean المتوسط
	Median الوسيط
نأخذ الأكثر تكرار في المجموعة . وقد لا يوجد لبعضها منوال وقد يوجد اكثر من منوال	Mode المنوال
Measure of dispersions	مقاييس التشتت
المدى = اكبر قيمة - اصغر قيمة	Range المدى
$S^2 = \frac{\sum_{i=1}^{n}(X_i - \bar{X})^2}{n-1}$ $S^2 = \frac{\sum_{i=1}^{n} X_i^2 - n\bar{X}^2}{n-1}$	Variance التباين
$S = \sqrt{S^2}$	Standard deviation الانحراف المعياري
$C.V = \frac{S}{x} \frac{\text{الانحراف}}{\text{المتوسط}}$	C.V معامل الاختلاف

Question 1:

If the number of visits to the clinic made by 8 pregnant women in their pregnancy period is:

12 15 16 12 15 16 12 14

Then,

1. *The type of the variable is:*

A)	*continuous*	*B)*	*ordinal*	*C)*	*nominal*	*D)*	*discrete*

2. *The sample mean is:*

A)	*11*	*B)*	*14*	*C)*	*8*	*D)*	*15*

3. *The sample standard deviation is:*

A)	*4.012*	*B)*	*-2.450*	*C)*	*1.773*	*D)*	*2.524*

4. *The sample median is:*

A)	*14.5*	*B)*	*15.5*	*C)*	*16.5*	*D)*	*15*

5. *The coefficient of variation is:*

A)	*70 %*	*B)*	*2.5 %*	*C)*	*28.25 %*	*D)*	*12.66 %*

6. *The range is:*

A)	*11*	*B)*	*4*	*C)*	*6*	*D)*	*28*

Question 2:

The data for measurements of the left ischia tuberosity (in mm Hg) for the SCI and control groups are shown below.

Control	131	115	124	131	122
SCI	60	150	130	180	163

4. *The mean for the control group is ……..*

(A)125.10	(B)128.10	(C) 124.60	(D) 127.10

5. *The variance of the SCI group is ……..*

(A) 2025.10	(B)2167.8	(C) 2026.10	(D) 2037.10

6. *The unit of coefficient of variation for SCI group is*

(A) mm Hg	(B) Hg	(C) mm	(D) Unit-less

7. *Which group has more variation*

(A) Control group	(B) SCI group	(C) Both groups have the same variation	(D) Cannot compare between their variations

Question 3:

Suppose that we have a random sample of observations as given in the following: 9, 6, 7, 15, 10, 12, 16, 9, 5, 11.
Then:

1.	The median is:							
	(A)	10.5	(B)	15	(C)	12.5	(D)	9.5
2.	The range is:							
	(A)	10	(B)	11	(C)	15	(D)	5
3.	The mean is:							
	(A)	15	(B)	9.5	(C)	10	(D)	12.5
4.	The standard deviation is:							
	(A)	4.63	(B)	3.62	(C)	8.72	(D)	9.31
5.	The mode is:							
	(A)	10	(B)	15	(C)	9	(D)	No mode
6.	The coefficient of variation (C.V.) is:							
	(A)	232.7%	(B)	36.21%	(C)	213.24%	(D)	39.59%

Question 4:

Consider the following marks for a sample of students carried out on 10 quizzes:

6, 7, 6, 8, 5, 7, 6, 9, 10, 6

Q. 1. *The mean mark is:*

A) 7 *B) 10* *C) 6* *D) 7.5*

Q. 2. *The median mark is:*

A) 6.5 *B) 5.5* *C) 7* *D) 6*

Q. 3. *The mode for this data is:*

A) 7 *B) 6* *C) 0* *D) 6 or 7*

Q. 4. *The range for this data is:*

A) 15 *B) 10* *C) 5* *D) 0*

Q. 5. *The standard deviation for this data is:*

A) 1.48 *B) 2.44* *C) 1* *D) 1.56*

Q. 6. *The coefficient of variation for this data is:*

A) 44.9% *B) 22.3%* *C) 19%* *D) 47.3%*

Question 5:

Temperature (in Faraheniet) recorded at 2 am in London on 8 days randomly chosen in a year were as follows:

40 -21 38 -9 26 -21 -49 44

1) *The average temperature for the sample is:*

(A) 248	*(B) 1*	*(C) 6*	*(D) 48*

2) *The median temperature for the sample is:*

(A) 17	*(B) -21*	*(C) 8.5*	*(D) -8.5*

3) *The mode of temperature for the sample is:*

(A) -21	*(B) 44*	*(C) 2*	*(D) -49*

4) *The standard deviation for the sample data is:*

(A) 35.319	*(B) 30.904*	*(C) 1247.43*	*(D) 4*

5) *The coefficient of variation for the sample is:*

(A) 49%	*(B) 17%*	*(C) 4%*	*(D) 588.7%*

6) *The range of the sample is:*

(A) 4	*(B) 8*	*(C) 40*	*(D) 93*

Question 6:

Some families were selected and the number of children in each family were considered as follows: 5, 8, 0, 8, 3, 7, 8, 9

Then,

1) *The sample size is:*

(A) 9	*(B) 6*	*(C) 8*	*(D) 5*

2) *The sample mode is:*

(A) 9	*(B) 0*	*(C) 8*	*(D) No mode*

3) *The sample mean is:*

(A) 48	*(B) 6*	*(C) 8*	*(D) 0*

4) *The sample variance is:*

(A) 2.915	*(B) 8.5*	*(C) 9.714*	*(D) 3.117*

5) *The sample median is:*

(A) 5.5	*(B) 7.5*	*(C) 8*	*(D) 7*

6) *The range of data is:*

(A) 8	*(B) 0*	*(C) 3*	*(D) 9*

7) *The sample coefficient of variation is:*

(A) 5.5	*(B) 8*	*(C) 0.52*	*(D) 7*

Question 7:

Consider the following weights for a sample of 6 babies: 5, 3, 5, 2, 5, 4

[1] The sample mean is

A	4	B	5	C	3	D	6

[2] The sample median is

A	4	B	5	C	4.5	D	3

[3] The sample mode is

A	4	B	3	C	4.5	D	5

[4] The sample standard deviation is

A	3.2649	B	8.2649	C	1.2649	D	2.2649

[5] The coefficient of variation for this sample is

A	40.00%	B	31.62%	C	200%	D	12.50%

Question 8:

1. Which of the following measures is not affected by the extreme values?

(A) Median	(B) Mean	(C) Variance	(D) Range

2. Which of the following location (central tendency) measures is affected by extreme values?

(A) Range	(B) Mean	(C) Median	(D) Mode

3. Which of the following measures can be used for the blood type in a given sample?

(A) Median	(B) Mean	(C) Variance	(D) Mode

Question 9:

1.	The biggest advantage of the standard deviation over the variance is:	
	(A)	The standard deviation is always greater than the variance.
	(B)	The standard deviation is calculated with the median instead of the mean.
	(C)	The standard deviation is better for describing the qualitative data.
	(D)	The standard deviation has the same units as the original data.
2.	Parameters and statistics:	
	(A)	Describe the same group of individuals.
	(B)	Describe the population and the sample, respectively.
	(C)	Describe the sample and the population, respectively.
	(D)	None of these.
3.	Which of the following location (central tendency) measures is affected by extreme values?	
	(A)	Median
	(B)	Mean
	(C)	Variance
	(D)	Range
4.	Which of the following measures can be used for the blood type in a given sample?	
	(A)	Mode
	(B)	Mean
	(C)	Variance
	(D)	Range

5. If x_1, x_2 and x_3 has mean $\bar{x} = 4$, then x_1, x_2, x_3 and $x_4 = 4$ has mean:

(A)	equal 4	(B)	less than 4	(C)	greater than 4	(D)	None of this

Question 10:

1. The sample mean is a measure of

   A) Relative position.

   B) Central tendency.

   C) Dispersion.

   D) all of the above.

2. The sample standard deviation is a measure of

   A) Relative position.

   B) Central tendency.

   C) Dispersion.

   D) all of the above.

Question 11:

The "life" of 40 similar car batteries recorded to the nearest tenth of a year. The batteries are guaranteed to last 3 years.

Class Interval	True class Interval	Midpoint	Frequency	Relative Frequency
1.5–1.9	1.45–1.95	1.72	2	0.050
2.0–2.4	1.95–2.45	2.2	D	0.025
2.5–2.9	2.45–2.95	C	4	F
A	2.95–3.45	3.2	15	0.375
3.5–3.9	B	3.7	E	0.250
4.0–4.4	3.95–4.45	4.2	5	0.125
4.5–4.9	4.45–4.95	4.7	3	0.075

1. *The value of A:*

A)	2.45–2.95	B)	3.5–4.9	C)	3.0–3.4	D)	3.55–3.95

2. *The value of B:*

A)	40.5 – 50.5	B)	3.45–3.95	C)	54 - 64	D)	44.5 – 54.5

3. *The value of C:*

A)	2.7	B)	28.5	C)	29	D)	59

4. *The value of D:*

A)	2	B)	4	C)	3	D)	1

5. *The value of E :*

A)	0	B)	10	C)	12	D)	11

6. *The value of F:*

A)	0.10	B)	0.15	C)	0.35	D)	0.25

Question 12:

The following table gives the age distribution for the number of deaths in New York State due to accidents for residents age 25 and older.

Age (Years)	Number of Deaths	Cumulative Frequency	True Class Interval	Relative Frequency	Cumulative Relative Frequency	Mid-Point
25 – 34	393	393	24.5 – 34.5	0.1188	0.1188	29.5
35 – 44	514	907	34.5 – 44.5	0.1554	0.2742	39.5
45 – 54	B	1367	------	0.1104	0.3882	49.5
55 – 64	341	1708	54.5 – 64.5	0.1031	0.4913	59.5
65 – 74	A	2073	64.5 – 74.5	0.1391	C	69.5
75 – 84	616	2689	------	0.1863	0.8167	79.5
85 – 94	618	3307	------	0.1869	1.0000	89.5
Total	------		------	------		

1. *The value of A is ……*

(A) 365	(B) 341	(C) 514	(D) 616

2. *The value of B is ……*

(A) 460	(B) 441	(C) 414	(D) 406

3. *The true class interval of the highest frequency is*

(A) 74.5 – 84.5	(B) 44.5 – 54.5	(C) 64.5 – 74.5	(D) 84.5 – 94.5

4. *The value of the gap (jump) between (non-true) class intervals is ……*

(A) No gaps	(B) 0.5	(C) 0	(D) 1

5. *The true class interval that has the lowest relative frequency is ……*

(A) 25 – 34	(B) 45 – 54	(C) 55 – 64	(D) 54.5 – 64.5

6. *The value of C is ……*

(A) 0.6101	(B) 0.6130	(C) 0.6304	(D) 0.6011

Question 13:

The table shows the weight loss (kg) of a sample of 40 healthy adults who fasted in Ramadan.

Class interval	Frequency	Cumulative Frequency
1.20 - 1.29	2	2
1.30 - 1.39	6	8
1.40 - 1.49	10	K
1.50 - 1.59	C	34
1.60 - 1.69	6	40

1) *The value of the missing value K is*

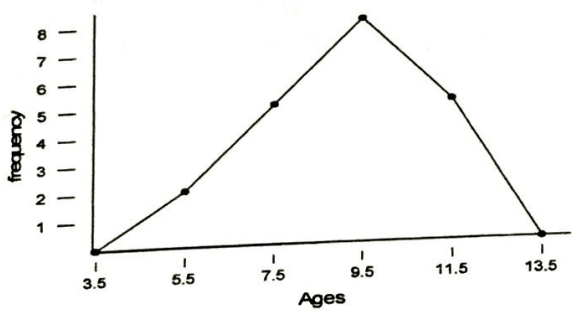
(a) 0 (b) 20 (c) 2 (d) 10 (e) None is correct

2) *The value of the missing value C is*

(a) 20 (b) 40 (c) 10 (d) 16 (e) None is correct

Question 14:

Consider the following frequency polygon of ages of 20 students in a certain school.



The frequency distribution of ages corresponding to above polygon is

(a)

True class limits	4.5- 6.5	6.5-8.5	8.5- 10.5	10.5 -12.5
frequency	2	5	8	5

(b)

True class limits	3.5- 5.5	5.5-7.5	7.5- 9.5	9.5 -11.5	11.5- 13.5
frequency	2	5	8	4	1

(c)

Class interval	5- 6	7-8	9- 10	11 -12
frequency	1	7	8	4

(d)

Class interval	5- 6	7-8	9- 10	11 -12
frequency	4	7	8	6

(e) None is correct

Question 15:

The following table gives the distribution of the ages of a sample of 50 patients who attend a dental clinic.

Age intervals (in years)	Frequency	Relative frequency
10 - 15	4	-
16 - 21	8	-
22 - 27	z	0.32
28 - 33	-	-
34 - 39	10	-

Less than	Cumulative Frequency
10	0
16	4
22	y
28	--
34	--
40	x

1.	The class width is:						
	(A)	6	(B)	10	(C)	150	(D)	19
2.	The value of x is:						
	(A)	22	(B)	28	(C)	50	(D)	10
3.	The value of y is:						
	(A)	4	(B)	12	(C)	19	(D)	150
4.	The value of z is:						
	(A)	14	(B)	12	(C)	50	(D)	16
5.	Percent of the patients with age between 16 and 21 is:						
	(A)	16%	(B)	8%	(C)	20%	(D)	32%
6.	The 5^{th} interval midpoint is:						
	(A)	38	(B)	52	(C)	27	(D)	36.5

Question 16:

Consider the following Table showing a frequency distribution of weights in a sample of 20 cans of fruits:

Class interval	*True Class Limits*	*Midpoint*	*Frequency*	*Relative Frequency*	*Cumulative Frequency*
19.2 – 19.4			*1*		
19.5 – 19.7				*0.10*	
19.8 – 20.0			*8*		
			4		

1. The fifth class interval is:

A) 20.2 - 20.4 *B) 20.1-20.3* *C) 21.0 - 21.2* *D) 20.4 - 20.6*

2. The second true class interval is

A) 19.45 - 19.75 *B) 19.5 – 19.7* *C) 19.25 - 19.35* *D) 20.2 - 20.4*

3. The midpoint of the fourth class interval is:

A) 20.5 *B) 20.2* *C) 19.9* *D) 20.1*

4. The frequency of the second class interval is:

A) 10 *B) 4* *C) 2* *D) 3*

5. The relative frequency of the fourth class interval is:

A) 0.20 *B) 0.15* *C) 0.13* *D) 0.40*

6. The cumulative frequency of the final class interval is:

A) 13 *B) 4* *C) 20* *D) 100*

Question 17:

Fill in the table given below. Answer the following questions.

Class Interval	Frequency	Cumulative Frequency	Relative Frequency	Cumulative Relative Frequency
5 - 9	8			
10 - 14	15		C	
15 – 19	11	B		D
20 - 24	A	40	0.15	

1) *The value of A is:*

(A) 6	(B) 4	(C) 34	(D) 40

2) *The value of B is:*

(A) 40	(B) 34	(C) 0.85	(D) 0.275

3) *The value of C is:*

(A) 23	(B) 0.575	(C) 0.275	(D) 0.375

4) *The value of D is:*

(A) 0.375	(B) 34	(C) 0.8	(D) 0.85

5) *The true class interval for the first class is:*

(A) 5 - 9	(B) 5 - 10	(C) 4.5 – 9.5	(D) 5.5 – 9.5

6) *The percentage of observations less than 19.5 is:*

(A) 34	(B) 85	(C) 1	(D) 6

Question 18:

Consider the following table showing a frequency distribution of blood test of 52 diabetes patients.

Class interval	Frequency	Cumulative frequency	Relative frequency	Cumulative relative frequency
101 – 120	--	--	0.4423	--
121 – 140	--	--	--	D
B	--	C	0.2115	--
161 – 180	--	--	0.0577	--
Total	A	--	1	--

[1] *The value of A is*

A	1	B	3	C	52	D	80

[2] *The class interval B is*

A	122-140	B	161-180	C	131-140	D	141-160

[3] *The value of C is*

A	49	B	15	C	34	D	52

[4] *The value of D is*

A	0.5308	B	0.7308	C	0.4308	D	0.8308

[5] *The true class intervals are*

A	100 –120 120.5 –139.5 141 –160 161 –180	B	99.5 – 119.5 120.5 –140.5 140.5 –159.5 160.5 –179.5	C	100.5 – 120.5 120.5 –140.5 140.5 – 160.5 160.5 – 180.5	D	100.5 – 120.5 121.5 – 140.5 141.5 –160.5 161.5 – 180.5

[6] *The midpoint of the first class interval is*

A	110.5	B	20	C	220	D	19

[7] *Histogram of the frequency distribution is built based on*

A	Frequency and cumulative relative frequency	B	Midpoints and cumulative relative frequency	C	True class interval and frequency	D	None of them

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