

Example 3

Construct a stem-leaf display for the following data (Scores for 30 students).

75	69	83	52	72	84	80	81	77	96
61	64	65	76	71	79	66	87	72	79
72	87	68	92	93	50	57	95	92	98

7. Find the z-score for each test and state which is higher

<i>Test</i>	x	\bar{x}	s
<i>I</i>	58	40	9
<i>II</i>	70	60	8

8. Check data set for Outliers 16, 18, 22, 19, 3, 21, 17, 20

Question 3:

1. Let be 6, 0, 2, 7, 5, 3, 9, 6, 1, 5, 4 data of a sample, then:

- a. Calculate the mean, median, mode(s), midrange and the range for the given data
- b. Calculate the Percentile P_{40th}

2. Let be 17, 6, 9, 12, 10, 5, 3, 0, 6, 0, 5, 4 data of a sample, then:

- a) Calculate the mean, median, mode(s), midrange and the range for the given data
- b) Calculate Q_1 , Q_3 and the Inter Quartile Range (IQR)

Let be the following frequency distribution table of data of a sample:

Class Limit الفئة	Class Boundaries الحدود الفعلية للفئة	Midpoint مركز الفئة	Frequency التكرار
6 - 7	5.5 - 7.5		2
	7.5 - 9.5		4
	9.5 - 11.5		12
	11.5 - 13.5		6
	13.5 - 15.5		2
Sum			

Then:

- Complete the above frequency distribution table.
- Calculate the mode and mean deviation for the above frequency distribution table

6. Find the percentile rank for the score 10 in the following given data Set ?

3, 4, 2, 3, 8, 13, 10, 25, 1, 30

Time Allowed: 3 Hours

Student Name: _____

Instructor: _____

Student ID: _____

عدد الصفحات (2)

(10) الأسئلة

أجب عن الأسئلة من 1 إلى 10 على دفتر إجابتك

Question 1: Give an example for each concept of the following:

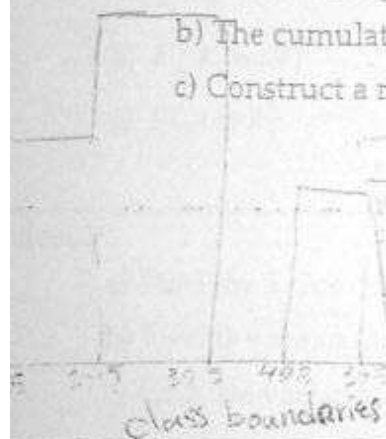
أمثلة مناسبة لكل من المفاهيم التالية

- a) Quantitative data. بيانات كمية \rightarrow weights.
 b) Qualitative data. بيانات نوعية \rightarrow gender.
 c) Discrete variable. متغير منفصل \rightarrow number of children in a family.
 d) Continuous variable. متغير متصل \rightarrow Temperature.

(4) mark

Question 2: For the distribution below find:

- a) Relative frequency. أوجد التكرار النسبي
 b) The cumulative frequency. أوجد التكرار التراكمي
 c) Construct a relative frequency histogram. ارسم المدرج التكراري النسبي



Class	Frequency	R.f
20-29	10	0.2
30-39	14	0.28
40-49	18	0.36
50-59	8	0.16
	50	

(8) mark

Question 3: For the following data: 8, 12, 16, 32, 40, 40, 12, 64. Find:

- a) The mean الوسط $\mu = \frac{8 + 16 + 32 + 40 + 40 + 12 + 64}{8} = \frac{212}{8} = 26.5$
 b) The median الوسيط $\frac{12, 16, 32, 40, 40, 64}{2} = 24$
 c) The mode(s) المنوال 12, 40
 لهم نفس التكرار $\frac{16 + 32}{2} = 24$

(9) mark

Question 4: For the given data: 10, 30, 16, 30, 40, 50, 12, 36. Find:

- a) The range المدى $50 - 10 = 40$
 b) The interquartile range المدى الربيعي $Q_3 - Q_1 = 36 - 16 = 20$
 c) The percentile rank of (40) الرتبة المئوية لـ 40 $P_n = \frac{30 + 30}{2} = 30$, $Q_3 = \frac{36 + 40}{2} = 38$

(9) mark

Question 4: Find each of the following:

- a) For the class 20 - 24 find the class boundaries. *أوجد الحدود النقطية*
 b) For the class 25 - 29 find the midpoint. *أوجد مركز الفئة*
 c) For the class 30 - 34 find width. *أوجد طول الفئة*
- $20 - 0.5 = 19.5$ | $24.5 - 29.5 = 5$
 $24 + 0.5 = 24.5$
- (3) marks

Question 5: For the sample data: 31, 9, 16, 14, 31, 11, 10, 22. Find

- a) The mean. *الوسط* $= 72$
 B) The median. *الوسيط* 9, 10, 11, 14, 16, 22, 31, 31 $\frac{14+16}{2} = 15$
 c) The mode. *المتوال* 31.
- (5) marks

Question 6: For the sample data: 32, 14, 46, 68, 50, 24, 46. Find

- a) The range. *المدى* $68 - 14 = 54$
 b) The interquartile range (IQR). *المدى الرباعي*
 c) The percentile rank of (50). *الرتبة المئوية*
- $\frac{5 + 0.5}{7} \times 100\% = 76.5\%$
- (5) marks

Question 7: Find the sample standard deviation

أوجد الانحراف المعياري للعينة

Class	Frequency	X_m	$X_m \cdot f$	$X_m^2 \cdot f$
4-8	1	6	6	36
9-13	2	11.5	23	242
14-18	3	16	48	768
19-23	2	21	42	882
24-28	2	26	52	1352
	10		170	3280

(3) marks

END OF EXAM

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$$\sigma^2 = \frac{\sum (X_m)^2 \cdot f - \frac{(\sum X_m \cdot f)^2}{N}}{N} = \frac{10(3280) - (170)^2}{10(9)} =$$

$$\frac{32800 - 28900}{90} = 43.33$$

$$\sigma = \sqrt{\sigma^2}$$

$$S^2 = \frac{11 \sum (X_m)^2 \cdot f - (\sum X_m \cdot f)^2}{N(N-1)}$$

$$= \sqrt{43.33} \approx 6.58$$

9. Find the coefficient of variation ($C.V$) for sample data with mean 20 and variance 9 ?

p 99

Example 10

Assume that we have two samples of scores A and B , if the mean of scores for class A is 85 and the standard deviation is 5. The mean of scores for class B is 90 and the standard deviation is 8. Compare the variation of the two classes.

Question 2:

1- The Data below represent a qualitative data of a sample survey, where A,B,C and D are categories

a

A	D	B	C	A	C	B	D	C	B
C	A	A	B	D	D	C	D	A	A
B	C	D	D	B	C	C	A	C	C
B	B	C	B	A	B	C	C	D	B

Complete the frequency table below for the given data

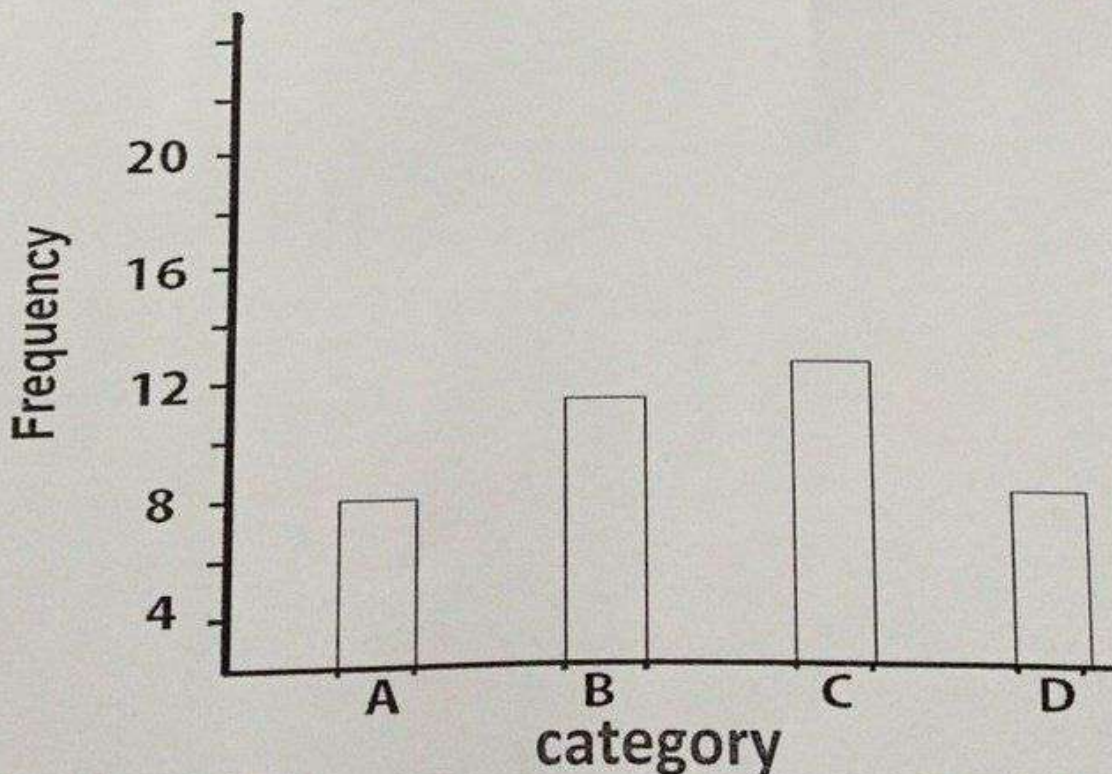
Category الصف	Frequency التكرار	Relative frequency التكرار النسبي	Percentage النسبة المئوية
A	8	0.2	20%
B	11	0.275	27.5%
C	13	0.325	32.5%
D	8	0.2	20%
المجموع Sum		1	100%

b) Pi Chart for the Category B = $(0.275)(360) = 99^\circ$

b) Find the angle for Pi Chart for the Category B

c) Draw bar graph for the Distribution

Bar graph



نصف درجة لكل اجابة صحيحة

[2] Question 1: Classify each variable as qualitative or quantitative.

- a) Time needed to finish a homework. الوقت اللازم لإنهاء واجب منزلي. (quantitative)
b) Colors of basketball team T-shirts. اللون قمصان فريق كرة سلة. (qualitative)
c) Number of students in PY. عدد الطلاب في السنة التحضيرية. (quantitative)
d) The ID of students in a college. الأرقام الجامعية لطلاب كلية. (qualitative)

نصف درجة لكل اجابة صحيحة

[2] Question 2: Classify each variable as continues (مستمر) or discrete (متقطع):

- a) Temperatures inside rooms. درجات الحرارة. (continues)
b) Number of peoples in a city. عدد السكان. (discrete)
c) Weights of peoples (الوزن). (continues)
d) Degrees of students exam (درجات الطلاب). (discrete)

نصف درجة لكل اجابة صحيحة

[2] Question 3: Classify each according to level of measurement as nominal, interval, ratio or ordinal.

- a) Weights of boxes of fruits. أوزان صناديق الفواكه. (interval) ✓
b) Nationalities of the workers in S.A. جنسيات العمال في السعودية. (nominal)
c) Ages of students in the college. أعمار الطلاب في الكلية. (ratio)
d) Color of eyes of people. ألوان عيون الناس. (nominal)

الاول - الثاني - الثالث : اذا التبت لمري صديقي

Question 4: Find the mean (المتوسط) for the sample data: 17, 3, 14, 6.

Question 5: Find the median (الوسيط) for the given data: 23, 9, 18, 12, 31, 11, 10, 25.

(2) marks

Question 6: Find the mode(s) (المتوال): 22, 15, 45, 65, 59, 22, 46.

(3) marks

Question 7: Find the range (المدى) for the given data: 20, 8, 12, 32, 17, 29.

(2) marks

Question 8: Find the interquartile range (IQR) (المدى الرباعي) for the given data: 4, 7, 9, 11, 18, 19, 25, 31.

4 7 9 11 18 19 25 31
 $Q_1 = 9$ $Q_3 = 19$

(4) marks

Question 9: Find the sample standard deviation:

أوجد الانحراف المعياري للعينة

Class	Frequency	X_m	$X_m f_m$	$(X_m)^2 f_m$
5-9	1	7	7	49
10-14	2	12	24	288
15-19	3	17	51	867
20-24	2	22	44	968
25-29	2	27	54	1458
	10		150	3630

$$s^2 = \frac{10(3630) - (150)^2}{10(9)}$$

$$= \frac{36300 - 22500}{90}$$

$$= \frac{13800}{90} = 153.33$$

$$= \sqrt{153.33} = 12.38$$

(4) marks

Question 10: Find the percentile rank (الرتبة المئوية) of (9) for the given data:

5, 6, 8, 10, 11, 12, 13, 14, 15

5 6 8 10 11 12 13 14 15

(3) marks

$$= \frac{9 \text{ No. of } X \text{ less than } 9}{n} \times 100$$

100
 END OF EXAM
 GOOD LUCK

$$= \frac{7}{10} \times 100 = 70\%$$

Handwritten notes and scribbles at the bottom of the page, including a circled '70' and some illegible text.

Question 1:

ش 40218

احص 140

1- Classify the following as ordinal, ratio, nominal or interval:

- a) Religious affiliation (الانتماء الديني)
 b) Degrees of temperature (درجة الحرارة)
 c) Grade A, B, C, D, F.
 d) Weights of peoples (وزن الأشخاص)
 e) Rating scale (poor, good, excellent)
 f) Degrees of temperature
 g) Eye color (لون العين)
 h) Height of peoples (طول الأشخاص)
 i) Eye color
 j) Degrees of temperature

- (nominal)
 (interval)
 (ordinal)
 (ratio)
 (ordinal)
 (interval)
 (nominal)
 (ratio)
 (nominal)
 (interval)

interval

tempertunr الحرارة
 toffil الشهادات

ratio

distance المسافة
 time الوقت
 salary الراتب
 Age العمر
 weight الوزن

2- Classify each variable as quaLitative or quaNtitative

نوعي

كمي

- a) Time needed to finish the exam. (الوقت الذي يحتاجه الختبار للانتهاء) (quaNtitative)
 b) Number of children in a family. (عدد الاطفال في العائلة) (quaNtitative)
 c) The age of peoples in year. (اعمار الاشخاص في السنة) (quaNtitative)
 d) The eye color of peoples. (لون عيون الاشخاص) (quaLitative)
 e) The hair color of peoples. (لون شعر الاشخاص) (quaLitative)
 f) Number of students in a school. (عدد الطلاب في الفصل) (quaNtitative)
 g) Weights of luggage of passengers. (وزن امتعة الركاب) (quaNtitative)
 h) Number of students in a school. (عدد الطلاب في الفصل) (quaNtitative)
 i) Weights of luggage of passengers. (وزن امتعة الركاب) (quaNtitative)
 j) Marital status of faculty members. (الحالة الاجتماعية لاجزاء هيئة التدريس) (quaLitative)



Midterm Exam / Stat. 140

Time Allowed: 2 Hours

Student Name: _____

Instructor: _____

Student ID: _____

عدد الصفحات (2)

عدد الأسئلة (7)

أجب عن الأسئلة التالية من 1 إلى 7 في دفتر اجابته

Question 1: Give an example for each of the following terms. *كذلك مثالاً لكل مما يلي -*

- a) Quantitative data. *بيانات كمية -*
- b) Qualitative data. *بيانات نوعية -*
- c) Discrete variable. *متغير منفصل -*
- d) Continuous variable. *متغير متصل -*

Question 2: For the given data:

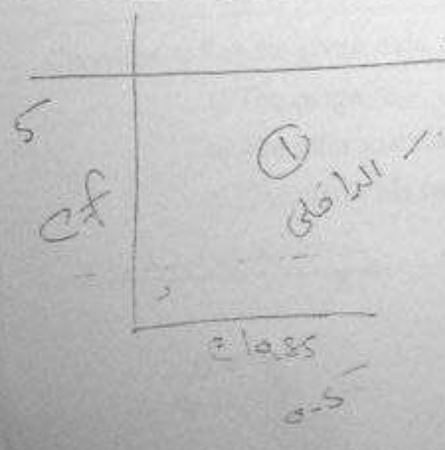
A B B A C B C C A B
C B C A C C B C B A

- a) Prepare a frequency distribution table. *كون جدول التوزيع التكراري.*
- b) Calculate the relative frequencies and percentages for all categories. *احسب التكرار النسبي والنسبي لجميع الفئات.*
- c) Draw a bar graph for the percentage distribution. *مثل التوزيع باستخدام الأعداد.*

Question 3: For the distribution below find:

- a) The cumulative frequency. *التكرار التراكمي.*
- b) Draw an ogive for the cumulative frequency distribution. *مثل بالمنحنى التكراري التراكمي.*

class	frequency
10-19	5
20-29	7
30-39	9
40-49	4



(4) marks

Question 5: Find the sample standard deviation: أوجد الانحراف المعياري للعينة

Class	Frequency
7-9	4
10-12	3
13-15	2
16-18	1

(4) marks

Question 6: Find the sample space for flipping a coin two times.

أوجد الفضاء العيني لرمية قطعة نقد مرتين

(2) marks

Question 7: A family has three children. Find the probability that all girls.

عند عائلة ثلاثة أطفال ما احتمال أن يكونوا جميعاً بنات

(2) marks

Question 8: If A and B are independent events $P(A) = 0.5, P(B) = 0.2$. Find

- $P(\bar{A})$
- $P(A \text{ and } B)$
- $P(A \text{ or } B)$

(5) marks

Question 9:

- Find the value of (k) in the probability distribution. أوجد قيمة k
- Find the mean (الوسط) of it.
- Find the variance. (التباين)

x	$P(x)$
0	k
1	0.20
2	0.25
3	0.30

(5) marks

Question 10: Scores on a test are normally distributed with a mean of 50 and a standard deviation of 10. Find the probability of a score less than 60. [Note that: $P(z > 1) = 0.16$].

تتخذ درجات اختبار شكل التوزيع الطبيعي بوسط يساوي (50) وانحراف معياري يساوي (10). أوجد احتمال أن تقل الدرجة

عن (60)

(2) marks

END OF EXAM