(36)

The following data represents the number of e-mails received by 30 secretaries at different companies during a one month period.

11	24	25							
22	22	23	14	48	15	14	19	45	47
18	11	12	25	32	31	36	25	24	21
		15	15	28	34	35	36	44	44

a- Complete the following table by dividing the data into 4 groups. Show your calculation of the width formula (11 points)

$$W = \frac{H-L}{\text{n of groups}} = \frac{48-11}{4} \approx 9.25 = 10$$

Name:

ID#:

Instruc

Number of e-mails		Frequency
11 -	20	9
21 -	30	10
31 -	40	6
41 -	50	5
Total		30

b- Fill in the blanks: (21 points)

1- The midpoint of the 2nd class is: _____ 25.5

2- The class boundary of the 2nd class is: 20.5 – 30.5

3- The relative frequency of the 3rd class is: ____ 0.2

-3

4- The percentage in the 3rd class is: _____ 20%

5- The RCF in the 3rd class is: _____ 0.83

6- In which class does the Median Fall? $\frac{n-1}{2} = \frac{30-1}{2} = 14.5 \Rightarrow$ first class

7- Which class is the modal class? ____ 2nd class   21 – 30

c- Calculate the Cumulative frequency of the second class and interpret its meaning in the context of the exercise (4 pts)

CF = 9 + 10 = 19

-2

Most of the secretaries receive between 21 and

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Most of the secretaries receive between 21 and

(4 pts)

Match the following variables with their scale of measurement.

1. Time needed by students (in minutes) to complete an experiment
2. Color of markers used by instructors
3. Evaluation of a product (Excellent, good, poor)
4. Boiling temperature of Tomato sauce

a. Nominal ✓
b. Ratio ✓
c. Ordinal ✓
d. Interval ✓

(4 pts)

Indicate whether the following variables are **Discrete** or **Continuous**.

1- Number of messages sent per day by a sample of 30 students —Discrete— ✓

2- Total amount of fresh juice (in Liters) prepared each day by a juice vender —Continuous

3- Number of daily hours of exercise by a team of football players —Continuous

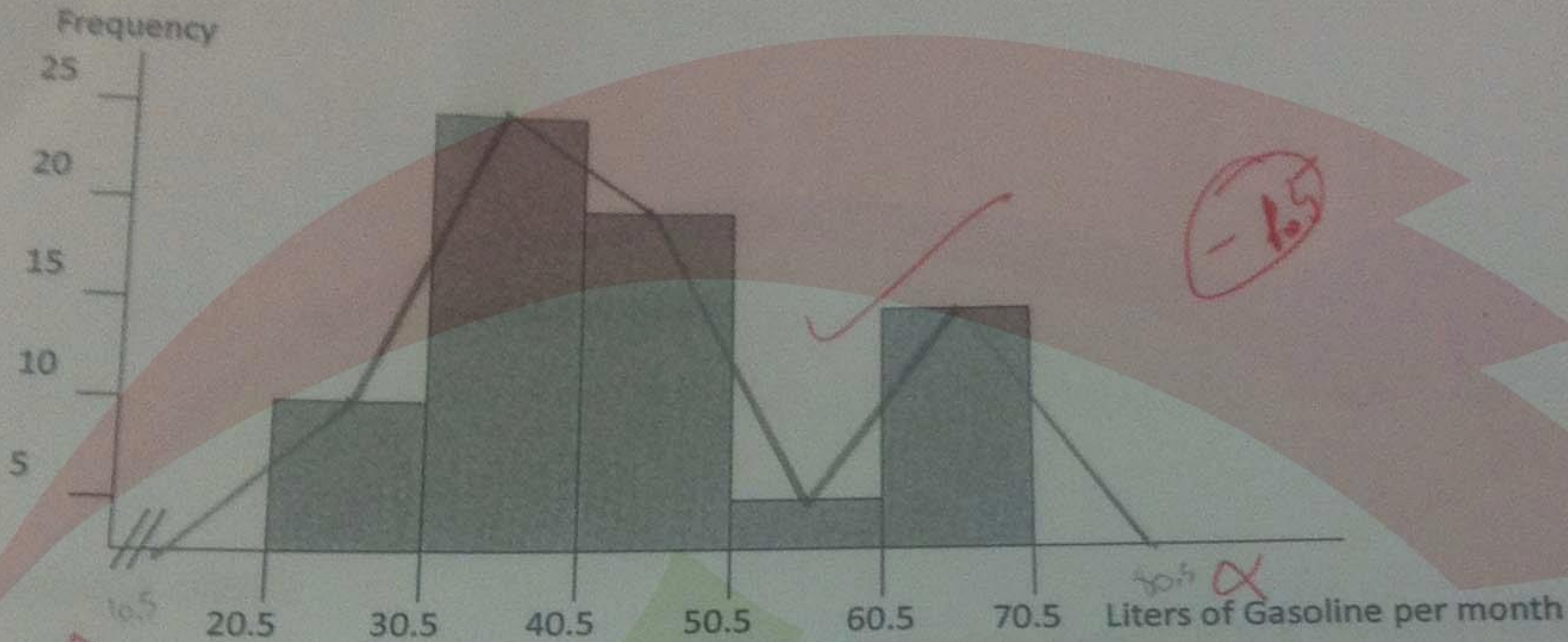4- Total number of pants sold per month by 3 branches of GS in one country —Discrete

-2

(4 pts)

Indicate whether the following studies are **Descriptive** or **Inferential**

1- Four faculty members were selected from each of the 6 faculties at NDU and were asked about their opinion regarding salary increase. The administration concluded that 80% of all faculty members at NDU are satisfied. —Descriptive— ✗

2- A teacher wanted to know whether all students in her class are understanding the material of one chapter. She gave a drop quiz and after correcting it she felt happy because 85% of her class passed the drop quiz with a grade above 70. —Descriptive

3- In the year 2020 all Lebanese will have access to NSSF. —inferential

4- 5 out of 10 fatalities in the United states in the year 2011 were due to car accidents. —inferential ✗

(24 pts)

The following histogram presents the frequency distribution of liters of gasoline consumed by a sample of workers to commute per month. (**Note**: liters of gasoline consumed per month are presented in the form of class boundaries).

a) Superimpose a polygon on top of the above histogram (4 pts)

b) What is the sample size?(3 pts) --------- 75 -----------

b) Calculate the Mean. Show your formula and calculation. **Round your answer to a complete number**(5 pts)

$$\bar{X} = \frac{\sum mF}{m} = 44.20 \quad \text{rounding} \quad \boxed{-2}$$
& Unit

c) Calculate the Standard Deviation. Show your formula and calculation. **Round your answer to a complete number** (5 pts)

$$SD = \sqrt{\sqrt{}\left(\frac{\sum m^2 F - \left(\frac{\sum mF}{m}\right)^2}{m-1}\right)}$$

= ~~13.864~~

= 13.2

rounding & Unit
$\boxed{-2}$

d) At least what percentage lies between 24 and 64? (7 points)

$$K_1 = \frac{24 - 44.2}{13.12} = -1.5$$

$$K_2 = \frac{64 - 44.2}{13.2} = 1.5$$

$$|K_1| = |K_2| = 1.5$$

$$\left(1 - \frac{1}{K^2}\right) \times 100 = 55.55\% \text{ at least lies between } 24 \text{ and } 64$$

chebychev's
theorem

(28 pts)

The following Stem and Leaf presents the frequency distribution of grades of STA 206 Exam I for a sample of 12 students

Stem	Leaf			
2	2			
3				
4	4	5	7	
5	4	5	6	5
6	5	4	7	
7				
8	8			

a)   Generate the data set (3 pts)

22   44   45   47   54   ~~55~~ ~~55~~ ~~56~~ 55   56   64   65

67   88

b)   Calculate the Mean. Show your formula and calculations. **Round your answer to a complete number** (4 pts)

$$\bar{X} = \frac{\sum x}{m} = 55.20 \text{ round}$$

Unit (-1.5)

b)   What is the value of the Median? (3 pts)

$$\text{Median} = \frac{55 + 55}{2} = 55$$ Unit (-1)

c) What is the value of the mode? (3 points)

55 ✓ UNIT (-1)

d) Calculate the Range. (3 pts)

$R = H - L = 88 - 22$
$= 66$

e) Calculate the Standard deviation. Show your formula and calculations. **Round your answer to a complete number** (4 pts)

$$SD = \sqrt{\frac{(\Sigma x^2) - \frac{(\Sigma x)^2}{m}}{m - 1}}$$
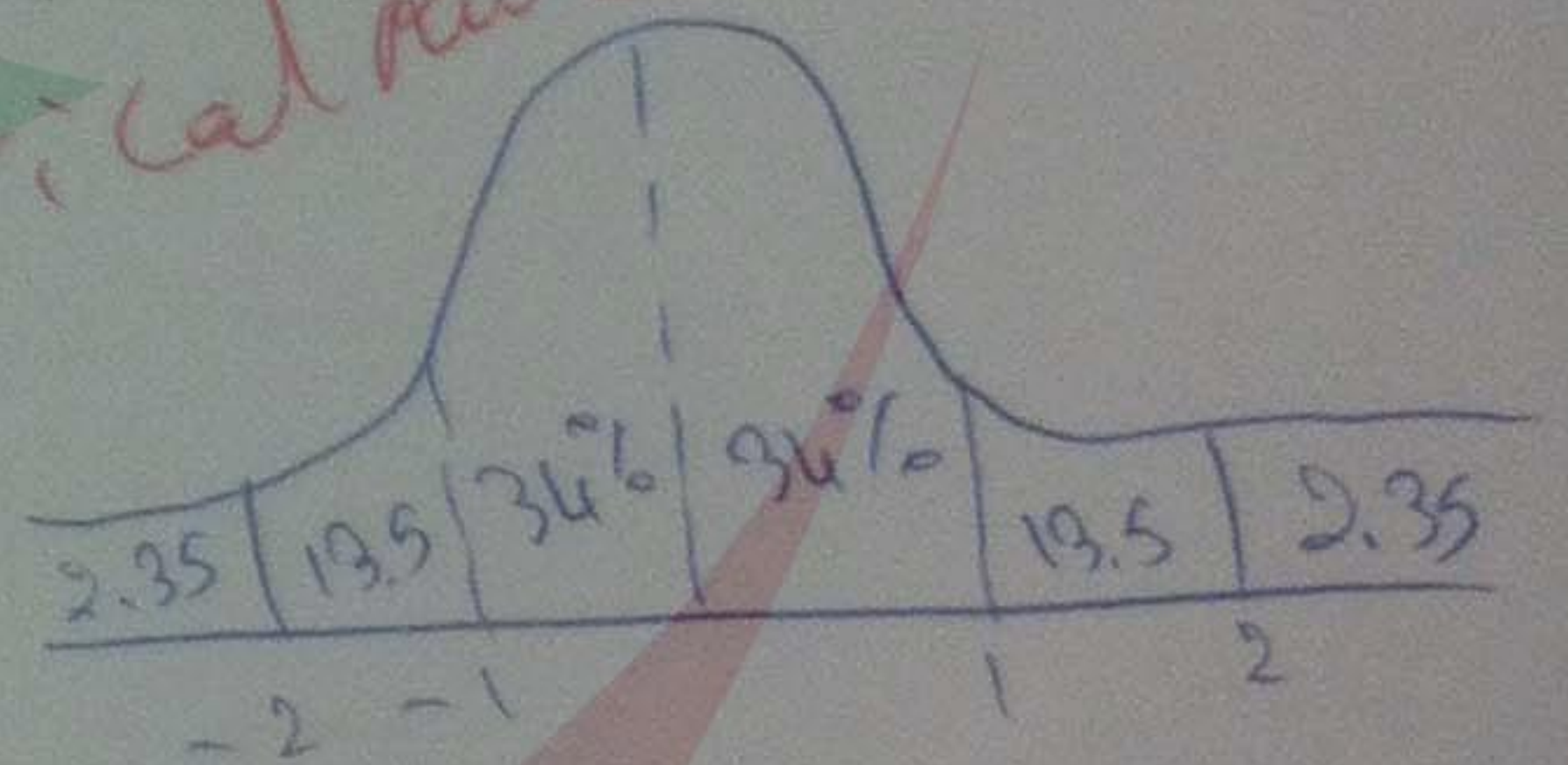
$= 16$ UNIT (-1)

f) Approximately what percentage of students scored 87 and below? (4 pts)

$k_1 = \dfrac{87 - 55.20}{16} \simeq 1.98 \simeq 2$

empirical Rule

$13.5 + 34 + 34 + 13.5 + 2.35$

$= 97.35\%$ of students scored 87 and below ✓

(-1)

| 2.35 | 13.5 | 34% | 34% | 13.5 | 2.35 |

-2 -1 1 2

g) Students whose score is 1 standard deviation below the mean and lower are considered very poor performers. Below which grade is a student considered a very poor performer. Justify your answer (4 points)

Below 54, students are considered very poor performers, since the mean is 55

(-4)