

(32 points) Choose the correct answer from the following questions:

1. Twenty-five students who use the college athletic facilities were asked if they would approve a facility fee increase in order to fund some new equipment for the weight room. Identify both the sample and population groups.

A. Sample: All students who use the athletic facilities
Population: The Twenty-five students who were selected

B. Sample: The Twenty-five students who were selected
Population: All students attending the college

**C. Sample: The Twenty-five students who were selected
Population: All students who use the athletic facilities**

D. Sample: The students who would approve a fee increase
Population: The Twenty-five students who were selected

Use the following data set to answer questions 2 and 3:

Certain kinds of tumors tend to recur. The following 42 data points represent the lengths of time (in months), for a tumor to recur after chemotherapy.

~~18~~ ~~18~~ ~~18~~ ~~1~~ ~~21~~ ~~2~~ ~~4~~ ~~46~~ 25 49 27
50 1 59 39 43 39 5 9 39 18 20
~~14~~ 45 54 59 46 50 29 12 19 36
38 40 43 41 10 50 41 28 19 39

1-12 /
13-24 ////
25-36
37-48
49-60 /

2. Construct a frequency distribution for the given quantitative data. Use a class width of 12

A. X

Class Frequency

1-13 ¹² 6

14-26 ¹² 12

27-39 ¹² 8

40-52 ¹² 12

53-65 ¹² 4

B.

Class Frequency

1-12 ¹² 6 0.5-12.5

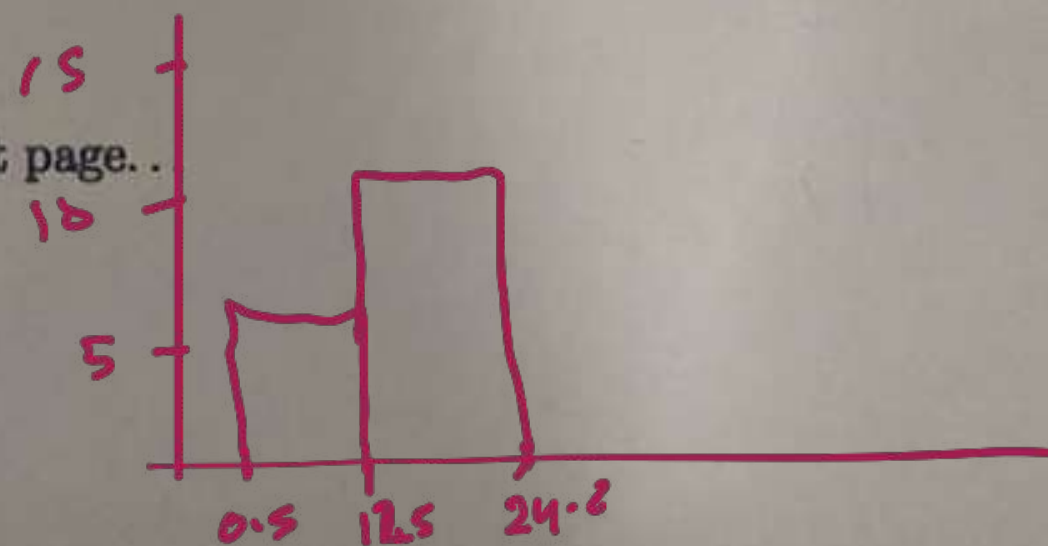
13-24 ¹² 10 12.5-24.5

25-36 ¹² 5 24.5-36.5

37-48 ¹² 13 36.5-48.5

49-60 ¹² 8 48.5-60.5

Please go on to the next page.



C.

D.

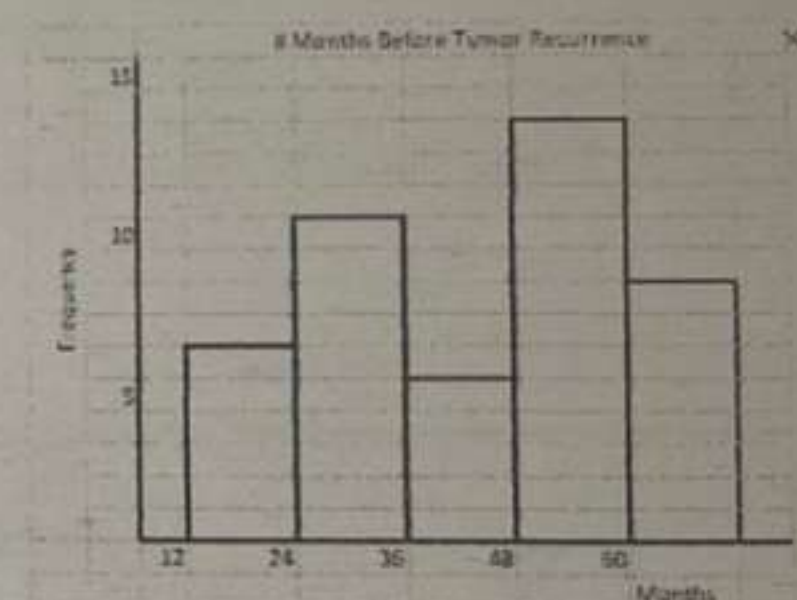
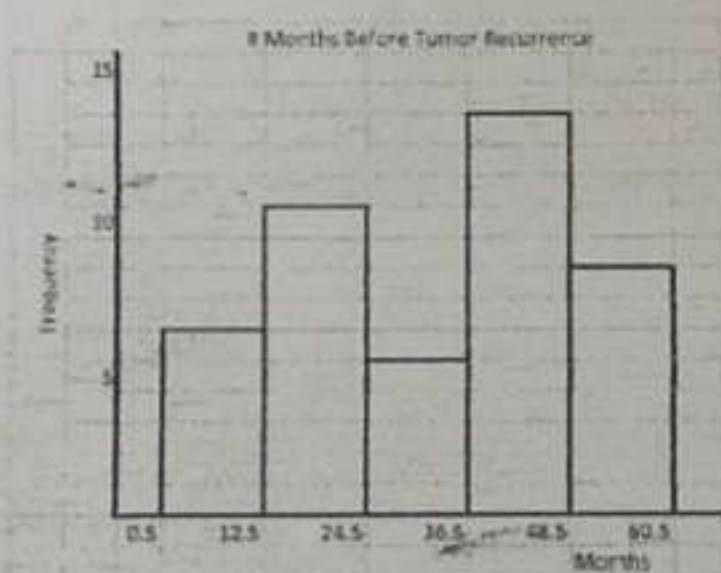
Class	Frequency
1 – 13 ¹²	6
14 – 26	10
27 – 39 ¹²	5
40 – 52 ¹²	13
53 – 65 ¹²	8

Class	Frequency
1 – 12	6
13 – 24	12
25 – 36	8
37 – 48	12
49 – 60	4

3. Construct a frequency histogram using the frequency distribution in question 10.

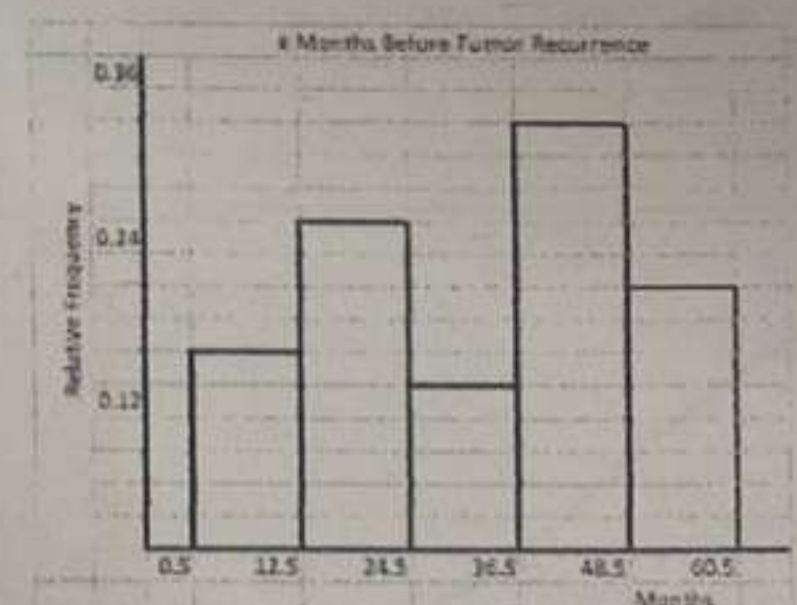
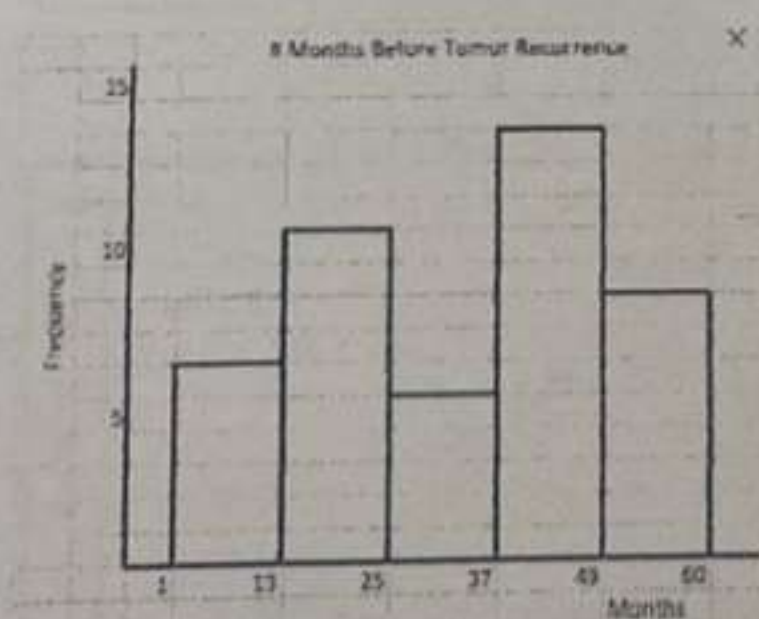
A.

C.



B.

D.



Please go on to the next page...

4. A researcher took a random sample of adults and asked them about their bedtime routine. The researcher found that the adults who drank a cup of tea before bedtime were more likely to fall asleep earlier than those who did not drink any tea. What type of study is this?

A. Experimental

☒ B. Observational

C. Educational

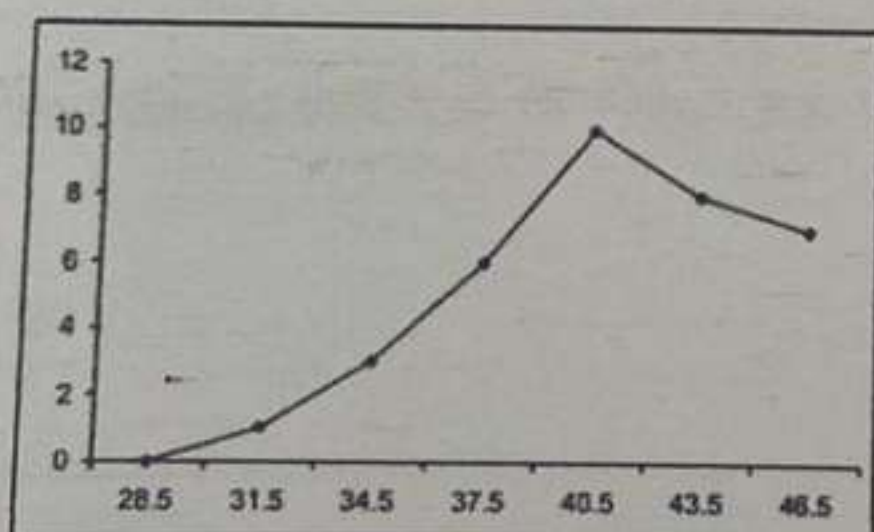
D. Neither

5. Using the following frequency distribution, Which of the following is the correct ogive?

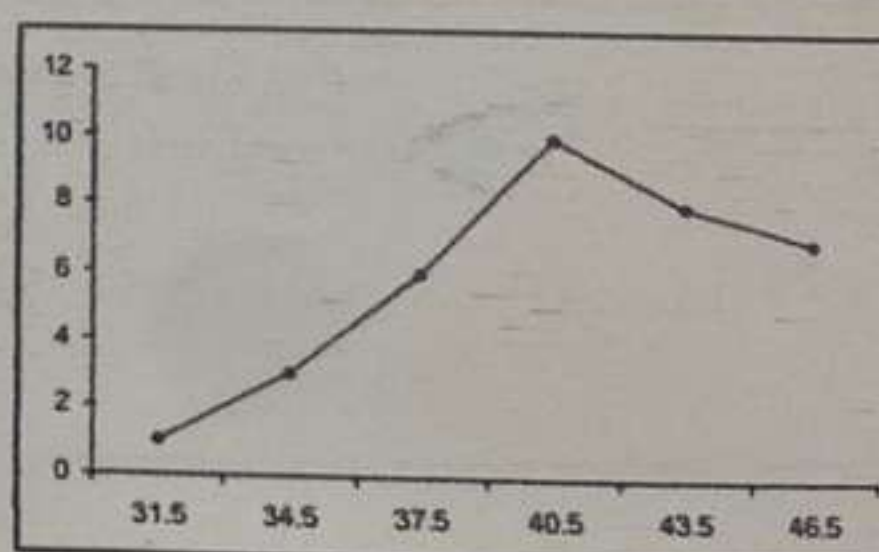
Temperature	Frequency
28.5–31.5	1
31.5–34.5	3
34.5–37.5	6
37.5–40.5	10
40.5–43.5	8
43.5–46.5	7

①
4
10
20
28
35

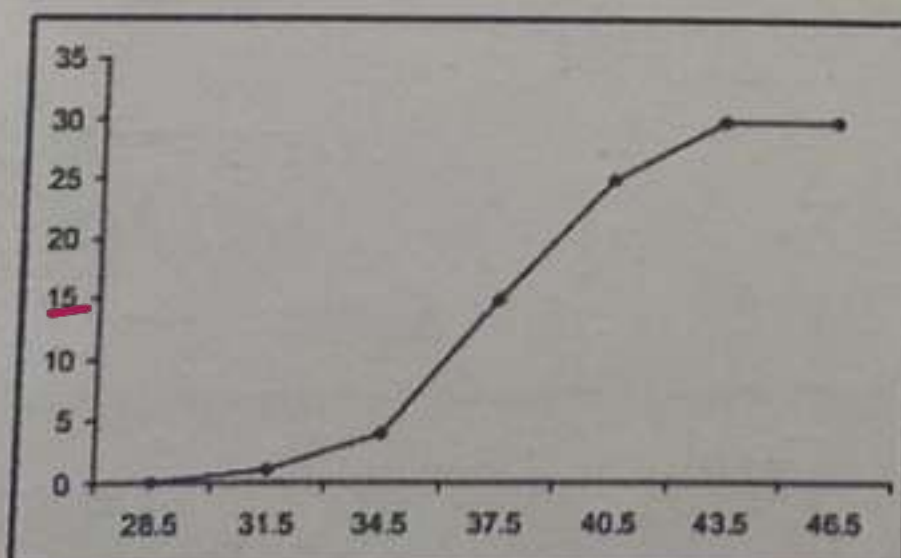
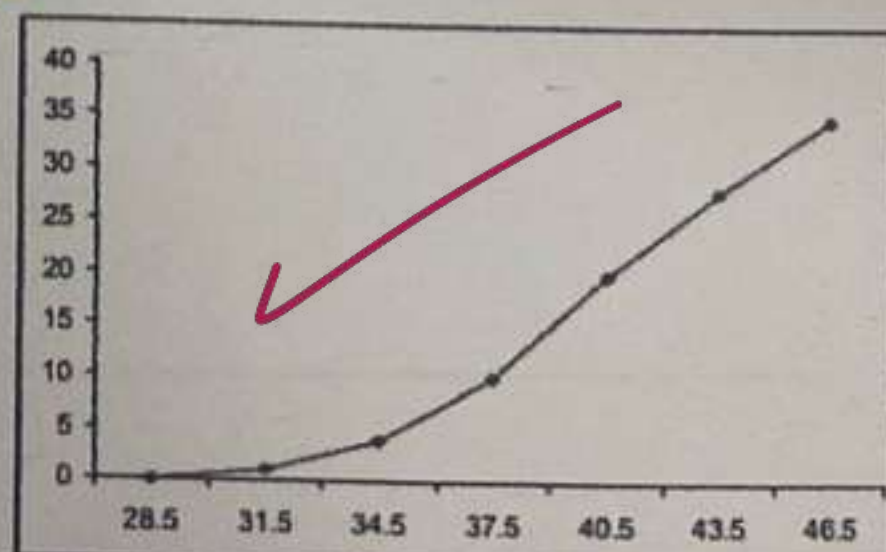
A.



C.



B.

☒ D.

Please go on to the next page...

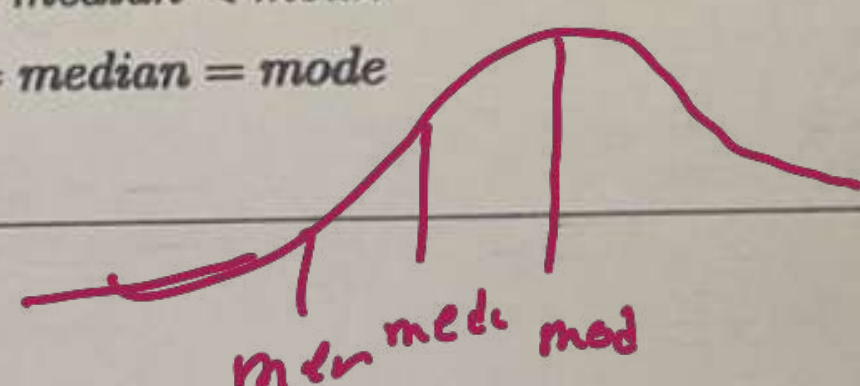
6. In a left-skewed distribution, we have the following relationship between the measures of central tendency:

A. $mean > median > mode$

B. $mode > median > mean$

C. $mode < median < mean$

D. $mean = median = mode$



7. Given the following frequency distribution

Class Boundaries Ages	Frequencies (No. of students)
13.5–18.5	4
18.5–23.5	9
23.5–28.5	12
28.5–33.5	15
33.5–38.5	17

4
13
25
40
57

Number of students whose age is less than 33.5 is...

A. 15

B. 57

C. 25

D. 40

8. The range of the data set $-5, -9, 0, 11, -2$ is $11 - (-9) = 20$

A. 3

B. 20

C. 2

D. -7

$$11 - -9 = 20$$

9. What is the midrange of the following numbers?

7, 13, 12, 14, 6, 14, 20, 20, 20

A. 13

B. 14

C. 7

D. 20

$$\frac{20 + 7}{2} = 13.5$$

10. Blood type is an example of what type of data?

Please go on to the next page...

- ☒ A. Qualitative
B. Quantitative

- C. Discrete
D. Ordinal

11. The daily high temperature in degrees Fahrenheit in Makkah for 30 consecutive days is an example of what type of data?

- A. Nominal
B. Ordinal

- ☒ C. Interval
D. Ratio

12. All the values in a data set are between 6 and 15, except for one value of 85. That value 85 is likely to be

6, 7, 8, 9, 10, 11, 12, 13, 14, 15

- ☐ A. the range
☒ B. an outlier

- ☐ C. the mean
☐ D. the boxplot

13. The heights of all fifth graders at elementary school is an example of what type of data?

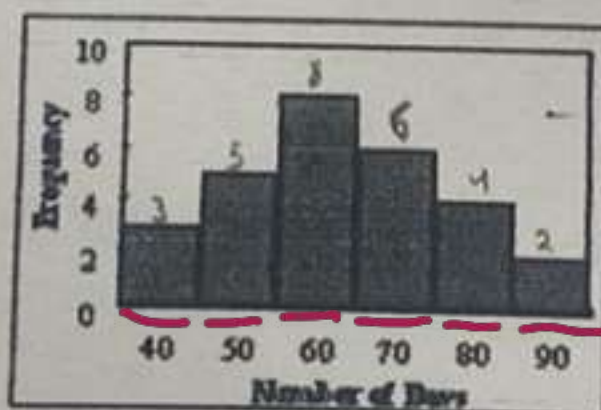
- ☒ A. Quantitative
☐ B. Continuous

- C. Discrete

- ☒ D. Both A and B

14. How many classes are in the following distribution?

$1 = 3.33 \times 10^9$



- ☒ A. 6
B. 8

- C. 7
D. 40

15. The number of employees at a local amusement park is an example of what type of data?

Please go on to the next page...

- A. Qualitative
B. Quantitative

- C. Discrete
D. Both B and C

16. A tooth whitening gel is to be tested for effectiveness. A group of 100 adults volunteer to participate in the study. 50 volunteers are given a gel that contains a tooth whitening agent. The others 50 are given a gel that does not contain the tooth whitening agent. What type of study is this?

- A. Experimental
B. Observational

- C. Educational
D. Neither

17. Determine the standard deviation for this sample:
0, 1, 3, 5, 2

A. 3.7

B. 1.9

C. 5

D. 0.4

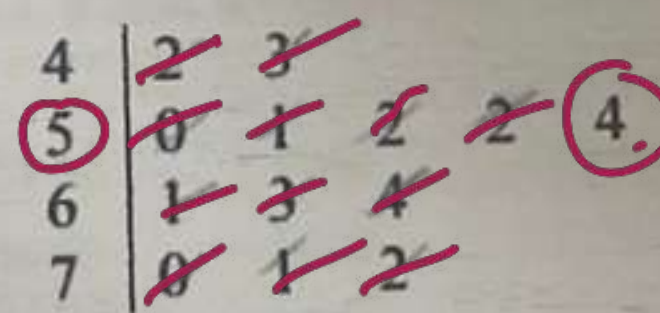
$$s = \sqrt{\frac{\sum (x - \bar{x})^2}{n-1}}$$

$$\sqrt{\frac{14.8}{4}} = 1.9$$

$$\frac{11(30 - 11)^2}{11(11-1)} = \frac{11}{5} = 2.2$$

	$x - \bar{x}$	$(x - \bar{x})^2$
0	-2.2	4.84
1	-1.2	1.44
3	0.8	0.64
5	2.8	7.84
2	0.2	0.04
		<u>14.8</u>

An insurance company researcher conducted a survey on the number of car thefts in a large city for 30 days last summer. Use the below graph to answer questions (18-19)



18. What are the smallest and largest values?

- A. 42, 72
B. 42, 70

- C. 43, 70
D. 43, 72

19. Find the median

A. 50

B. 54

C. 61

D. 53

Please go on to the next page...

$$\bar{x} = 64 = \frac{\sum x}{5}$$

$$\sum x = 320$$

20. If the mean of five values is 64, find the sum of the values.

☒ A. 320

$$\frac{320}{5} = 64$$

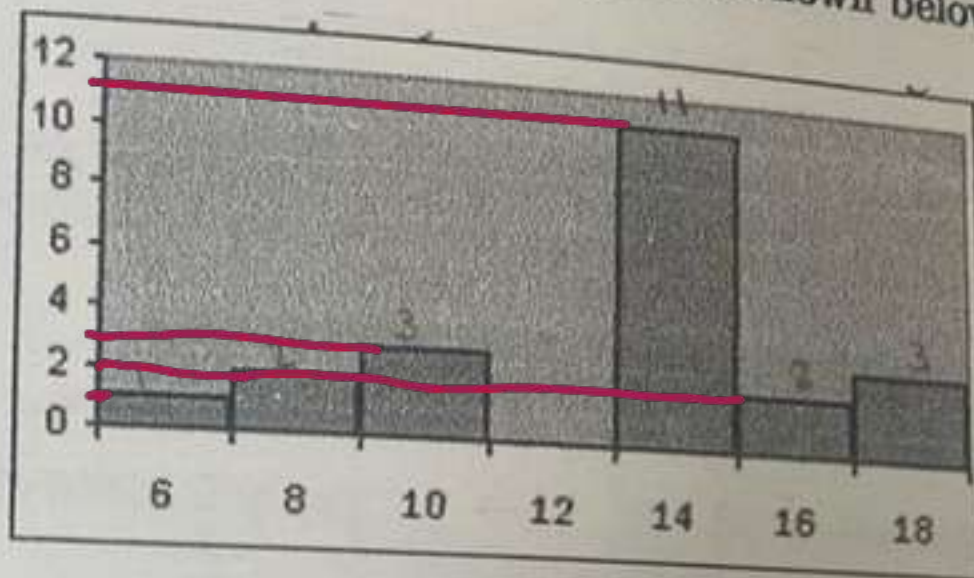
B. 12.8

$$= 2.56$$

C. 64

D. 200

21. The total frequency of the data whose histogram is shown below is approximately:



A. 11

☒ B. 22

C. 50

D. 100

Use the following data set which contains the prices of 15 different ice cream bars to answer 22 - 24

× \$0.80	× \$1.29	× \$1.09	× \$0.99	× \$0.75
× \$1.15	× \$0.69	× \$0.69	× \$0.80	× \$1.05
× \$1.09	× \$0.45	× \$0.80	× \$0.75	× \$1.19
0.69	3.53	2.58	2.67	

~~0.69, 0.75, 0.80, 0.80, 0.80, 0.89, 0.99, 1.05, 1.09, 1.09, 1.15, 1.19, 1.25, 1.29~~

22. Find the mean of the given data

A. \$1.00

B. \$0.19

☒ C. \$0.99

D. \$1.05

23. find the median of the given data

~~0.69, 0.75, 0.80, 0.80, 0.80, 0.89, 0.99, 1.05, 1.09, 1.09, 1.15, 1.19, 1.25, 1.29~~

- A. \$1.00
B. \$0.19

C. \$0.99

D. \$1.05

24. find the mode of the given data

- A. \$0.80
B. \$1.09

C. No Mode

D. Both A and B

25. To conduct a study on depression among the elderly, all of the patients from four local nursing homes were used. There were 12 nursing homes in the area. Identify the type of sampling

- A. Stratified sampling
B. Simple Random sampling

C. Cluster sampling

D. Systematic sampling

26. Which type of chart describes wedges of a circle that visually display proportional parts of a total population that share a common characteristic?

A. Pareto Chart

B. Pie Chart

C. Bar Chart

D. Time Series Chart

27. A student wants to calculate their GPA for the most recent semester. A's are worth 4 GPA points, B's are worth 3 GPA points, C's are worth 2 GPA points, and D's is worth 1 GPA point. If the student took 15 credit hours and earned the following grades in their classes, find the student's weighted GPA (mean) for the semester.

Class	# Credits	Grade
US History	3	A 4
Biology	5	C 2
Algebra	4	B 3
English	3	A 4

12
10
12
12

A. 3.75

B. 3.07

C. 3.25

D. 3.33

$$x = \frac{\sum w_i x_i}{\sum w_i}$$

$$= \frac{12 + 10 + 12 + 12}{3 + 5 + 4 + 3}$$

Please go on to the next page...

28. Subscribers to a new smartphone app were assigned numbers. Then a sample of 50 subscribers was selected by using a random number generator. Those selected were asked to rate the ease of use of the app. Identify the type of sampling used.

A. Stratified sampling

B. Simple Random sampling

C. Cluster sampling

D. Systematic sampling

29. If a set of 9 numbers has a standard deviation 10, then its variance is

A. 100.00

B. 3.33

C. 33.33

D. 30.00

$$V = \sigma^2 = 10^2$$

A random sample of the ages of 50 professional football players is summarized in the frequency distribution below. Answer questions (30-32)

Ages of Professional Football Players			ΣxP	Class boundaries	CF
Age	Mid	Number of Players			
16 - 20	18	1	18	15.5 - 20.5	1
21 - 25	23	17	391	20.5 - 25.5	18
26 - 30	28	14	392	25.5 - 30.5	32
31 - 35	33	8	264	30.5 - 35.5	40
36 - 40	38	5	190	35.5 - 40.5	45
41 - 45	43	3	129	40.5 - 45.5	48
46 - 50	48	2	96	45.5 - 50.5	50

25.2

$$n = 50$$

$$1486$$

30. The mean of the grouped data is

A. 29.6

B. 27.6

C. 31.6

D. 25.1

$$\bar{x} = \frac{\Sigma xP}{\Sigma P}$$

$$= \frac{1486}{50} = 29.72$$

31. The median of the grouped data is

$$L + \left(\frac{\frac{n}{2} - CF}{f} \right) w$$

Please go on to the next page...

$$25.5 + \left(\frac{25 - 18}{14} \right) \times 5 = 28$$

$$\frac{50}{2} = 25$$

$$\frac{50}{2} = 25$$

A. 23

C. 33

B. 28

D. 29

32. the variance is

A. 945.93

C. 7.3

B. 18.33

D. 52.49

NOTE:The variance: $s^2 = \frac{n(\sum X^2) - (\sum X)^2}{n(n-1)}$, $s^2 = \frac{n(\sum f \cdot X_m^2) - (\sum f \cdot X_m)^2}{n(n-1)}$ Weighted mean: $X_w = \frac{\sum wX}{\sum w}$ The median for grouped data: $MD = \frac{\frac{n}{2} - cf}{f} \times w + L_m$

f	x_m	$(x - \bar{x})^2$	$f(x - \bar{x})^2$
1	18		134.56
17	23		740.52
14	28		35.84
8	33		42.48
5	38		352.8
3	43		538.68
2	48		677.12
			<u>2572</u>

(29.6)

$$\text{Variance} = \frac{\sum f(x_m - \bar{x})^2}{n-1} = \frac{2572}{49} = 52.49$$