Pharmaceutical statistics

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ARKAN ACADEMY

Quiz past papers

1) The standard normal distribution

a. Can have any mean value
b. Can have any standard deviation value
c. Is symmetrical around a mean value of 0
d. Is symmetrical around a mean value of 1
e. It differs from one population to another
f. Is plotted as f(x) versus x
g. More than one option is correct

2) A batch of tablets has a normal distribution for them. If a sample was chosen and most of its tablets were in the upper tail of the distribution. This sample

a. Is biased and will lead to under estimation of the population mean
b. Is biased and will lead to over estimation of the population mean
c. Is unbiased and will lead to under estimation of the population mean
d. Is unbiased and will lead to over estimation of the population mean
e. is a representative sample and will lead to accurate estimation of the true population mean

3) For a sample of 30 values and for the calculation of their geometric standard deviation, the sum of squared deviations form log of the mean was obtained as 12.5. The standard deviation of the geometric mean is

a. 4.5
b. 2.8
c. 2.6
d. 2.9
e. 4.4
f. 3.2

4) Three samples (A, B, and C) have the following parameters. It can be concluded that the variability of

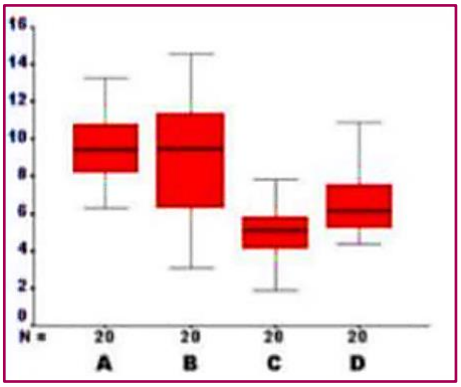
a. C>A>B
b. A>C>B
c. B>A=C
d. A=C>B
e. A>C>B
f. C=B>C

	A	B	C
Mean	350	100	20
SD	35	5	2

5) For a distribution with median value of 80 and mode of 90 and an outlier of 7

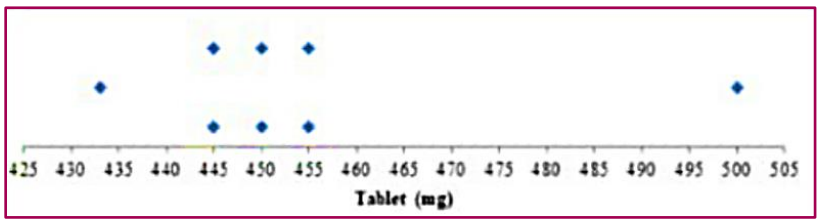
a. The mean is lower than 80
b. The mean is higher than 90
c. The mean is between 80 and 90.
d. The mean is higher 80

6) For the following plot, set variability..... is positively skewed and set ..... has higher variability



a. B, A
b. B, D
c. C, A
d. A, B
e. D, B
f. A, C
g. A, D

7) The following plot is for 300 tablets……. tablets have weights higher than 445



a. 75
b. 100
c. 175
d. 275
e. 200
f. 125
g. 225
h. 150

8) For the following ordered array. IQR is:

1, 2, 3, 4, 4, 4, 4, 5, 6, 6, 6, 7, 7, 7, 10

a. 2
b. 7
c. 4
d. 3
e. 8
f. 5
g. 6

9) A new suspension dosage form of a bitter drug was tested for palatability. It was given to 15 subjects and on a scale from 0 (not palatable) to 10 (palatable) the following results were obtained. 6, 4, 4, 4, 6, 6, 6, 10, 1, 4, 3, 7, 7, 5, 4, 4 The best central tendency parameter for the data is:

a. 4 as the mode
b. 4 and 7 as modes
c. 4 as the median
d. 4.5 as the median
e. 5 as the mean
f. 5 as the median

10) For a normal distribution of drug content, more uniform drug content in tablets is achieved as the distribution of drug content is:

a. Less packed in the center, shorter and with fatter tails
b. Less packed in the center, shorter and with thinner tails
c. More packed in the center, taller and with fatter tails
d. More packed in the center, taller and with thinner tails
e. Less packed in the center, taller and with fatter tails
f. Less packed in the center, taller and with thinner tails
g. More packed in the center, shorter and with thinner tails

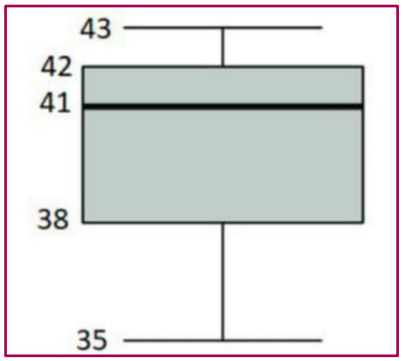
11) Most of the variables we deal with in statistics are …..... and such variables have ..... distribution.

a. Discrete, binomial
b. Continuous, binomial
c. Ordinal, discrete
d. Continuous, normal
e. Discrete, normal

12) In bioavailability using linear scales of both Cp and time, drug half-life is usually estimated as

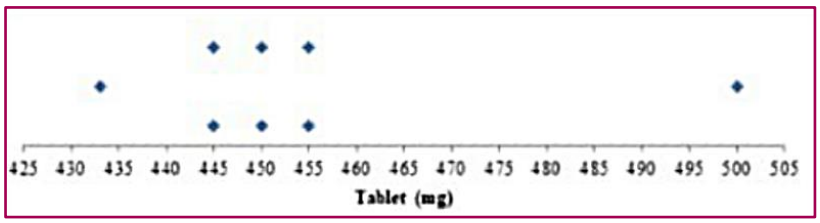
a. The time to reach the C-max of Cp versus time curve
b. The slope of the terminal portion of log Cp versus time curve
c. The slope of the terminal portion of Cp versus time
d. Area under curve of log Cp versus time curve
e. Area under curve of Cp versus time curve
f. The time to reach the C-max of X log Cp versus time curve

13) The following plot suggests



a. The data are normally distributed and thus the mean is equal to 41
b. The data are negatively skewed and thus the mean is higher than 41
c. The data are positively skewed and thus the mean is higher than 41
d. The data are negatively skewed and thus the mean is lower than 41
e. The data are positively skewed and thus the mean is lower than 41

14) For the following plot. IQR is



a. 10
b. 15
c. 20
d. 5
e. 25

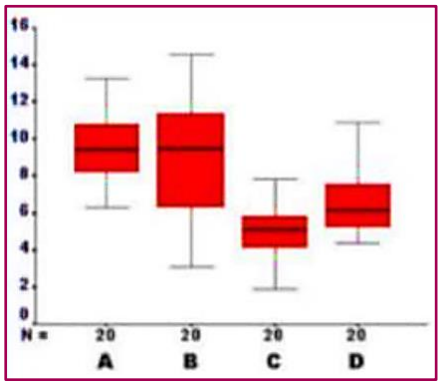
15) When an outlier is confirmed in a data set

a. The outlier should be first investigated, but must be deleted anyway in the calculation of the average
b. Must be deleted right away in the calculation of the average
c. The outlier should be first investigated and accordingly could be kept or deleted in the calculation of the average
d. The outlier should be first investigated, but must be kept anyway in the calculation of the average
e. Must be kept right away in the calculation of the average
f. The correct answer is: The outlier should be first investigated and accordingly could be kept or deleted in the calculation of the average

16) Which of the following is correct for a population and a sample taken from the population:

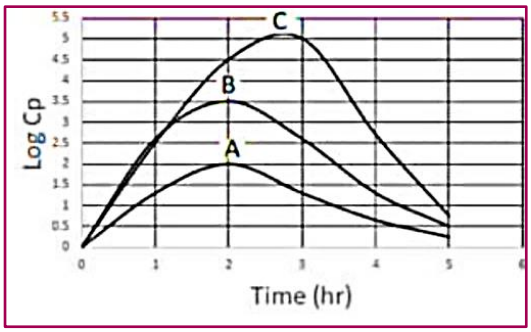
a. μ can be easily determined despite N is so large, thus the mean of the sample is not used to estimate μ as n is small relative to N
b. μ can be easily determined as N is so small and thus no need to use the sample mean
c. μ cannot be determined as N is so small, thus the mean of the sample is used to estimate u as n is large relative to N
d. μ can be easily determined as N is so large and thus no need to use the sample mean
e. μ cannot be determined as N is so large, thus the mean of the sample is used to estimate μ as n is small relative to N

17) For the following plots. There is likely a difference between sets



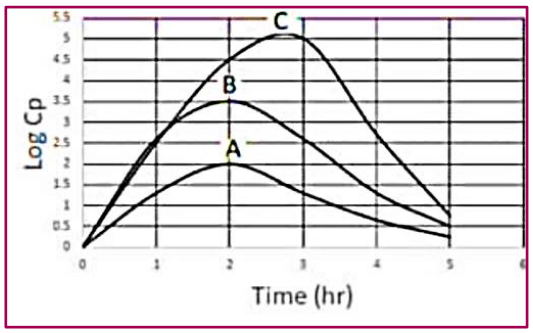
a. A and C
b. A and D
c. C and D
d. A and B
e. Two options are correct
f. None of the options is correct

18) For the following curves of bioavailability study of 3 drugs (A, B and C)



a. C has the highest extent of drug reach to the general circulation, but this reach is slower than for A or B
b. C has higher extent and rate of drug reach to the general circulation than A or B
c. B has higher rate of drug reach to the general circulation than A, but slower rate than C
d. A and B have slower rate of drug reach to the general circulation than C, and the corresponding extent is lower
e. All have the same extent of reach to the general circulation, but the corresponding rate is the highest for C
f. More than one option is correct

19) For the following curves are for bioavailability of a drug in 3 subjects. The mean of C-max is calculated as



a. 34420
b. 2954
c. 10095
d. 247
e. 3162

20) The data of the following plot if drawn as vertical Box whisker plot would give suggesting

a. Longer upper whisker than lower whisker, positive skewness.
b. Longer lower whisker than upper whisker, negative skewness.
c. Equal upper and lower whiskers, normality of the distribution.
d. Longer upper whisker than lower whisker, negative skewness.
e. Longer lower whisker than upper whisker, positive skewness.

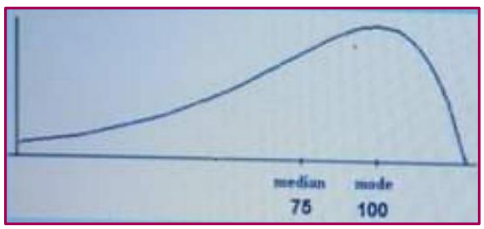
21) For the following data. 110, 140, 120, 130, 100, 150, 170, 160, 190, 180. Q3 is:

a. 170
b. 155
c. 165
d. 150
e. 160

22) Two batches (A and B) of two drugs have given mean potencies of 90 mg for A and 10 mg for B with standard deviations of 22.5 for A and 2.5 for B. It can be deduced that

a. Variability is the same between A and B
b. More information is required to decide
c. The variability of A is higher than that of B
d. The variability of B is higher than that of A
e. variability comparison cannot be made as the two mean are completely different.

23) For the following frequency distribution plot, the mean is



a. Higher than 75 and lower than 100
b. Higher than 100
c. Lower than 75
d. Equal to 100
e. Equal to 75

24) The content is the active drug assay in a sample of tablets,234-246-251-254.5-273, what is the median

a. 234
b. 246
c. 251
d. 254

25) The mean of the above values

a.234
b.246
c.251
d.251.7
e.254.5

26) Which of the following is a measure for central tendency?

a. First quartile
b. Second quartile
c. Third quartile
d. Interquartile range

27) Suppose that the first quartile Q1and the Interquartile range IQR of the sample data are equal, and that the third quartile Q3 equals 36. Then the first quartile Q1of the sample data equals:

a. 25
b. 32
c. 18
d. None

28) What is the unit of the coefficient of variation?

a. It is a dimensionless value
b. The same unit of the mean
c. The same unit of standard deviation
d. µg/mL
e. L/g.

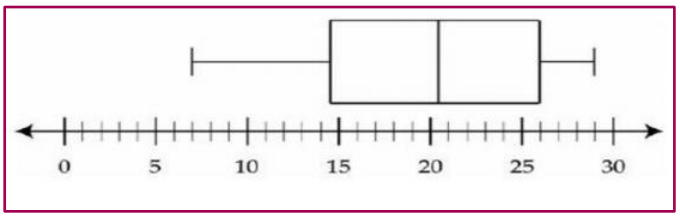
29) All of the following are parameters of dispersion measurement except.

a. First quartile
b. Second quartile
c. Third quartile
d. Interquartile range
e. Coefficient of variation

30) The following are the maximum plasma concentration (µg/ml) after taking a certain drug in four volunteers. 5, 10, 20, 30. Find out the geometric mean of these data is:

a. 10.40
b. 13.16
c. 16.25
d. 4.48

➢ **Answer the following three questions regarding the graph:**



31) One of the following statements is False:

a. This graph is called Box and Whisker plot
b. It gives a five-number summary of the data.
c. Provides information about both central and dispersion properties of the data
d. The range, the interquartile range and the mean can be estimated from this graph

32) The value of the75th percentile is

a. 7
b. 14.5
c. 20.5
d. 26
e. 29

33) The median value is

a. 7
b. 14.5
c. 20.5
d. 26
e. 29

34) One of the following is false about normal distribution

Answer: it can be unimodal or bimodal distribution

35) The following are the maximum plasma concentration (µg/ml) after taking a certain drug in fivevolunteers.10, 20, 30 Find out the harmonic mean of these data is

Answer: 16.36

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Answer	c	b	a	d	a	e	g	d	a	d	d	b	d	a	c	e	c	a	e	b	a	a

Question	23	24	25	26	27	28	29	30	31	32	33
Answer	c	c	b	b	c	a	b	b	d	d	c

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