Started on	Saturday, 19 March 2022, 4:09 PM
State	Finished
Completed on	Saturday, 19 March 2022, 4:50 PM
Time taken	40 mins 19 secs
Marks	18.00/20.00
Grade	**9.00** out of 10.00 (**90**%)

Question **1**

Complete

Mark 1.00 out of 1.00

What are the median and mode of the following series : 2; 2; 2; 4; 4; 5; 5; 6; 8; 11; 12; 16; 18?

- a. 6 and 5
- b. 5 and 2
- c. 5.5 and 2
- d. 5 and 5
- e. None of the others

Question **2**

Complete

Mark 1.00 out of 1.00

Assume that human body temperatures are normally distributed with a mean of 98 (degree F) and a standard deviation of 0.5(degree F). Describe the sampling distribution for the sample mean body temperature of 50 selected persons.

a. Approximately normal with a mean of 98(degree F) and a standard deviation of 0.07(degree F)

b. None of the other choices is correct

c. Normal with a mean of 98(degree F) and a standard deviation of 0.07(degree F)

d. Approximately normal with a mean of 98(degree F) and a standard deviation of 0.01(degree F)

e. Normal with a mean of 98(degree F) and a standard deviation of 0.01(degree F)

Question **3**

Complete

Mark 1.00 out of 1.00

Give $f(x)=0,75 \cdot 0,25^{x}$, x = 0,1,2... is the probability mass function. Which the following statement is NOT TRUE?

a. $P(X \leq 2) = 63/64$

b. $P(X = 2) = 3/64$

c. $P(X \geq 1) = 48/64$

d. All of the others

Question **4**

Complete

Mark 1.00 out of 1.00

A population has a mean of m=100 and a standard deviation of s=15. If we draw a simple random sample of size n=36, what is the probability that the sample mean $\overline{x}$ will be less than 105? That is, what is $P(\overline{x} < 105)$?

a. 0.9901847

b. 0.9522096

c. 0.9087888

d. 0.9772499

Question **5**

Complete

Mark 0.00 out of 1.00

Two Web colors are used for a site advertisement with given probabilities:

Ad color	Affiliate (30%)	Search (70%)
Blue	0.7	0.4
Green	0.3	0.6

What is the probability that a visitor is from a **search site** given that the **green** ad was viewed?
Round to 2 decimal places.

- a. 0.82
- b. 0.6
- c. 0.42
- d. 0.18
- e. None of these

P(Green) = P(Green | Affiliate)*P(Affiliate) + P(Green | Search)*P(Search) = 0.3*0.3 + 0.6*0.7
P(Search | Green) = P(Green | Search)*P(Search)/P(Green)
= (0.6*0.7)/(0.3*0.3 + 0.6*0.7)

Question **6**

Complete

Mark 1.00 out of 1.00

Choose the true statement(s):

a. Population is any subset of the elements of a sample.

b. In statistical inference, the reasoning is from population to a sample .

c. Population is in sample.

d. Population is any finite or infinite collection of individual units or objects.

Question 7

Complete

Mark 1.00 out of 1.00

Suppose that after 10 years of service, 40% of computers have problems with motherboards (MB), 30% have problems with hard drives (HD), and 15% have problems with both MB and HD. What is the probability that a 10-year old computer has problems with MB or HD?

a. 0.45

b. 0.55

c. 0.3

d. 0.7

e. 0.4

$P(MB) = 0.4,\ P(HD) = 0.3,\ P(MB \cap HD) = 0.15$

$\Rightarrow P(MB \cup HD) = P(MB) + P(HD) - P(MB \cap HD) = 0.4 + 0.3 - 0.15$

$= 0.55$

Question 8

Complete

Mark 1.00 out of 1.00

Suppose that P(A|B) = 0.4, P(A|B') = 0.3, and P(B) = 0.6. What is P(A)?

- a. None of these
- b. 0.12
- c. 0.1
- d. 0.36
- e. 0.7

Apply total probability formula

$$P(A) = P(A|B)P(B) + P(A|B')P(B')$$

$$= 0.4 * 0.6 + 0.3 * 0.4$$

$$= 0.36$$

Question 9

Complete

Mark 1.00 out of 1.00

Construct a 98% confidence interval for the population mean. Assume the population has a normal distribution. A study of 14 bowlers showed that their average score was 192 with a standard deviation of 8. Let t_0.01,13=2.65.

a. (222.3, 256.1)

b. (328.3, 386.9)

c. None of the other choices is correct

d. (186.3, 197.7)

e. (115.4, 158.8)

Question 10

Complete

Mark 1.00 out of 1.00

A sample of five price/earnings ratios for companies in the Services sector follows.
15 11 14 17 12
A confidence interval for the population mean is requested. In order to construct the confidence interval one must assume

a. No assumptions are needed

b. None of choices are correct

c. that the population standard deviation is known

d. that the sample came from a normal distribution

Question **11**

Complete

Mark 1.00 out of 1.00

Let X represent the amount of time it takes a student to park in the library parking lot at the university. If we know that the distribution of parking times can be modelled using an exponential distribution with a mean of 4 minutes, find the probability that it will take a randomly selected student more than 10 minutes to park in the library lot.

a. 0.670320

b. None of the other choices is correct

c. 0.082085

d. 0.917915

e. 0.329680

Question **12**

Complete

Mark 1.00 out of 1.00

If we select a sample with sample size 40 from a population with mean of 20 and standard deviation of 5 then:

a. Sample mean will be approximately normally distributed with mean of 20 and standard deviation of 0.79.

b. Sample mean will be exactly normally distributed with mean of 20 and standard deviation of 5.

c. Sample mean will be approximately normally distributed with mean of 20 and standard deviation of 5.

d. Sample mean will be exactly normally distributed with mean of 20 and standard deviation of 0.79.

Question **13**

Complete

Mark 1.00 out of 1.00

A salesperson knows that 20% of her presentations result in sales. Use the normal approximation formula for the Binomial distribution to find the probabilities that in the next 60 presentations at least 9 result in sales.

Let P(Z < -1.13) = 0.1268 and P(Z < -0.81) = 0.2089.

- a. 0.8732
- b. 0.7911
- c. 0.6421
- d. 0.1241
- e. None of the other choices is correct

Question **14**

Complete

Mark 0.00 out of 1.00

The continuous random variable X has probability density function is $f(x)=e^{-x}$, $x>0$. Find P(X=2010).

- a. 1
- b. None of the others.
- c. 0
- d. $1/e^{-2010}$

Question **15**

Complete

Mark 1.00 out of 1.00

Suppose that $\mu = 16$ and $\sigma^2 = 20$ for a population. In a sample where $n = 100$ is randomly taken, what is the standard deviation for the sample mean?

- a. 0.2
- b. 0.45
- c. 0.02
- d. None of the other choices is correct
- e. 0.16

Question **16**

Complete

Mark 1.00 out of 1.00

An exciting computer game is released. Twenty percent of players will buy an ***advanced version*** of the game. Among 20 users, what is the expected number of people who will buy the ***advanced version***?

- a. 4
- b. None of the others
- c. 10
- d. 20
- e. 5

Let X be the number of players who will buy the advanced version among 20 players.

Then X has a binomial distribution with parameter n = 20, p = 0.2

==> E(X) = np = 20*0.2 = 4

Question 17

Complete

Mark 1.00 out of 1.00

A manufacturer of electronic calculators takes a random sample of 1200 calculators and finds that there are 8 defective units. Construct a 95% confidence interval on the population proportion. Let z_0.025 =1.96.

a. [0.204, 0.208]

b. [0.0021, 0.0113]

c. None of others

d. [0.0021, 0.274]

Question **18**

Complete

Mark 1.00 out of 1.00

The life in hours of a 400 - watt light is known to be normally distributed with standard deviation of 25 hours.
A random sample of 20 lights has a mean life of 1014 hours. Construct a 95% two - sided confidence interval on the mean life.
Let $z_{0.025} = 1.96$

- a. (1003, 1005)
- b. None of others.
- c. (1003, 1050)
- d. (1003, 1025)

Question **19**

Complete

Mark 1.00 out of 1.00

Eight measurements were made on the inside diameter of forged piston rings used in an automobile engine. The data (in millimeters) are 74.10; 74.30; 74.15; 74.00; 74.25; 74.20; 74.05; and 74.14. Calculate the sample mean.

- a. 74.14875
- b. 74.00875
- c. 74.00815
- d. None of these
- e. 74.00578

Question **20**

Complete

Mark 1.00 out of 1.00

Consider the time to recharge the flash in a camera. The probability that a camera passes the test is 0.9, and the cameras perform independently. What is the probability that the second failure is obtained at the fifth test?

a. 0.003
b. 0.029
c. None of the others
d. 0.035
e. 0.047

Let X be the number of tests until the second failure.

Then X has a negative binomial distribution with parameter p = 0.1 and r = 2.

We wish to find P(X = 5).

$$P(X=5)=\binom{4}{1}0.1^2(0.9)^3=0.029$$