Practice Exam(1)

Q1 Which of the following statements is a false statement?

(A) In a bar graph, data should be discrete.

(B) An advantage of the box plot is that we can catch outliers.

(C) Box plot is used to display quantitative (numeric) data only.

(D) In a box plot, we use points to indicate data values and their frequency.

Q2 Which of the following statements is false?

(A) Years in which Brazil wins the World Cup are quantitative data.

(B) A sample is a subset of a population.

(C) A sample statistic could change from sample to sample.

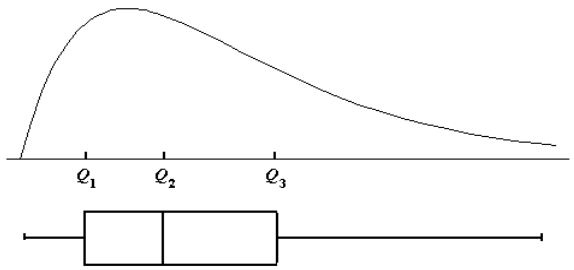
(D) A population parameter is not fixed for a population.

(E) A parameter is a numerical description of a population characteristic.

Q3 For the sample 1,2,5,8,9 the variance equals

(A) 10 (B) 2.5 (C) 5 (D) 7.5 (E)12.5

Q4 Which of the following statements is correct about the following distribution?



A) The mean and median are equal

B) $Q_2 - Q_1 < Q_3 - Q_2$

C) The distribution is skewed to the left

D) $Q_2 - Q_1 > Q_2 - Q_3$

E) B & C

Q5 The table shows the numbers of students from Amman, Irbid and Zarqa in the colleges of science and IT in a certain university:

	Amman	Irbid	Zarqa
Science	200	110	90
IT	150	80	70

The probability that a randomly selected student is from Zarqa given that the student is in the science college equals to

(A) 0.225 (B) 0.275 (C) 0.267 (D) 0.421 (E) 0.438

Q6 A test is given to a class consisting of 70% females and 30% males, where 75% of the females passed the test and 65% of the males passed the test. If a student who passed the test is selected from this class, the probability that this student is female will be:

(A) 0.7447 (B) 0.7292 (C) 0.7955 (D) 0.7778 (E) 0.7609

Q7 In a sample of 10 observations the mean is 5 and variance is 2. Let x_i be the ith observation. In such a case $\sum(x_i)^2 =$

(A) 178 (B) 378 (C) 508 (D) 658 (E) 268

Q8 One of the following numbers describes a population parameter:

(A) 40% of the university students are males

(B) A survey of 1328 U.S adults found that 32% are smokers.

(C) 350 out of 500 U.S adults trust their political leaders.

(D) A study of 200 U.S adults found that 38% received an influenza vaccine.

(E) A random check of 300 retail stores found that 25% were not storing meat properly.

Q9 One of the following statements is false:

(A) A bar graph is a graphic method in which the height of each bar represents frequency or relative frequency.

(B) We use a histogram to graph quantitative data.

(C) Bar charts provide a convenient way to present qualitative data graphically.

(D) Mean is preferred to be used when data has outliers, since it's not affected by them.

Q10 In a sample the first quartile is 11 and the third quartile is 17. In such a case the outliers could be

(A) 1,25 (B) 25,29 (C) 1,3 (D) 1,29 (E) 3,31

Q11 The following table presents the number of students in 3 different classes.

	Class A	Class B	Class C
Male	15	10	20
Female	18	25	12

If a student is selected randomly, the probability that this student is male or from class B will be:

(A) 35/100 (B) 70/100 (C) 80/100 (D) 10/35 (E) 35/45

Q12 The annual salaries of employees of a certain company are normally distributed, with a mean of \$54000 and a standard deviation of \$10000. Find the probability that a randomly selected employee has an annual salary greater than \$59000

(A) 0.3085 (B) 0.2743 (C) 0.2420 (D) 0.2119 (E) 0.1841

Q13 Suppose that x is $Binomial(n, p)$ with $E(x) = 6$ and $\sigma_x^2 = 2.4$

Then $P(x > 7) =$

(A) 0.002 (B) 0.013 (C) 0.055 (D) 0.046 (E) 0.167

Q14 Which of the following two events are not mutually exclusive?

(A) Two dice are rolled. Even A: Rolling a number greater than 5 in the first die.
Event B: Rolling a number less than 3 in the second die.

(B) A die rolled. Event A: Rolling a number greater than 4.
Event B: Rolling a number less than 2

(C) Event A: Randomly select a student who studies more than 5 hours daily.
Even B: Randomly select a student who studies for less than 2 hours daily.

(D) Even A: Randomly select a student with a birthday in April.
Event B: randomly select a student with a birthday in May.

(E) Event A: Randomly select an employee who owns exactly one house.
Event B: Randomly select an employee who owns exactly two houses.

Q15 A class has 100 students, where 30 of the students know how to play a musical instrument and 60 of these students are male. Of the male student, 20 can play musical instruments. Find the probability that a randomly selected student is a male or can play an instrument:

(A) 0.30 (B)0.90 (C) 0.20 (D) 0.70 (E) 0.80

Q16 Find the area under the standard normal curve to the right of -0.56 and to the left of 0.56

(A) 0.6630 (B) 0.6102 (C) 0.5528 (D) 0.4908 (E) 0.4246

Q17 Which of the following statements is false?

(A) The expected value of a random variable can be a negative number.

(B) Continuous random variables represent counted data.

(C) A coin is tossed 7 times. If X is the number of heads within the seven times, then X is a random variable.

(D) A die is rolled 3 times and the random variable X is the number of ones within the three times. Then the possible values of X are 0,1,2,3.

(E) The possible outcomes of a continuous random variable can be represented by an interval on a number line.

Q18 Let $x \sim N(0,1)$ and $a > 0$. The one of the following is false:

(A) $P(x < -a) = P(x > a)$

(B) $P(0 < x < a) = P(x < a) - 0.5$

(C) $P(-a < x < a) = 1 - 2P(x < -a)$

(D) $P(x < -a) + P(x > a) = 1$

(E) $P(x > -a) = 1 - P(x < -a)$

Q19 The probability of success for a surgery is 60%. If this surgery is performed on 10 patients, then the probability that this surgery will be successful on at most 2 patients is:

(A) 0.382 (B) 0.167 (C) 0.046 (D) 0.055 (E) 0.012

Q20 If the graph is skewed right, and the median=40, which of the following could be possible for the mean?

(A) 39 (B)77 (C) 35 (D) 19

Question	Answer	Question	Answer
1	D	11	B
2	D	12	A
3	E	13	E
4	B	14	C
5	A	15	D
6	B	16	E
7	E	17	B
8	A	18	D
9	D	19	E
10	D	20	B

Answers:

Q1 (D)

Q2 D

Q3

X	1	2	5	8	9
x^2	1	4	25	64	81

$\sum x = 1 + 2 + 5 + 8 + 9 = 25$

$\sum x^2 = 1 + 4 + 25 + 64 + 81 = 175$

$S^2 = \frac{\sum x^2}{n-1} - \frac{(\sum x)^2}{n(n-1)} = \frac{175}{4} - \frac{(25)^2}{5(4)} = 12.5 \rightarrow$ (E)

Q4

The answer is B.

Q6 70% females so 75% P , 25% P complement

30% males 65% P , 35% P complement

$$P(f / P) = \frac{P(f \cap P)}{P(P)} = \frac{0.70 \times 0.75}{(0.70 \times 0.75) + (0.30 \times 0.65)} = 0.7292 \rightarrow (B)$$

Q7 $\bar{x} = \frac{\sum x}{n} \rightarrow 5 = \frac{\sum x}{10} \rightarrow \sum x = 50$

$S^2 = \frac{\sum x^2}{(n-1)} - \frac{(\sum x)^2}{n(n-1)} \rightarrow 2 = \frac{\sum x^2}{9} - \frac{(50)^2}{10(9)} \rightarrow \sum x^2 = 268 \rightarrow$ E

Q8 (A)

Q9 (D)

Q10

$Q_1 = 11$, $Q_3 = 17$ $\rightarrow$ IQR = 6

Lower: $Q_1 - 1.5$ IQR = $11 - 1.5(6) = 2$

upper: $Q_3 + 1.5$ IQR = $17 + 1.5(6) = 26 \rightarrow$ D

Q11

$P(M \cup B) = P(M) + P(B) - P(M \cap B) = \frac{45}{100} + \frac{35}{100} - \frac{10}{100} = 0.7 = \frac{70}{100} \rightarrow (B)$

Q12 M = 54,000 , σ = 10,000

$$P(x > 59{,}000) = P\left(\frac{x-4}{\sigma}\right) > \frac{59{,}000 - 54{,}000}{10{,}000}$$

$$P(z > 0.5) = 1 - P(z < 0.5) = 1 - 0.6915 = 0.3085 \rightarrow (A)$$

Q13

E(x) = 6 → n.P = 6 …..(1)

Var(x) = 2.4 → n.P.q =2.4 …...(2)

Sub (1) in (2) → 6(q) = 2.4 → q = 0.4 & P = 0.6

Now sub in (1) to get n: n(0.6) = 6 → n = 10

∴ χ ~ Bin (10 , 0.6)

$P(x > 7) = P(X=8) + P(X=9) + P(X=10) = 0.167 \rightarrow (E)$

Q14 not disjoint → has intersection → (C)

Q15

$P(M \cup B) = P(M) + P(P) - P(M \cap B)$

$$= \frac{60}{100} + \left[\left(\frac{60}{100} \times \frac{20}{60}\right) + \left(\frac{40}{100} \times \frac{10}{40}\right)\right] - \frac{60}{100} \times \frac{20}{60} = 0.70 \rightarrow (D)$$

Hint: use tree diagram.

Q16 P(-0.56 < z < 0.56) = 0.4246 → (E)

Q17 (B)

Q18 D

Q19

n=10 and P= 0.6 so $P(X \leq 2) = 0.01229 \rightarrow E$

Q20 B