

College of Engineering

First Year Students

Engineering statistics

Questions Bank

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Q1: Power companies need information about customer usage to obtain accurate forecasts of demands. Investigators from Wisconsin power and Light determined energy consumption (BTUs) during a particular period for a sample of 90

Class	1-2.9	3-4.9	5-6.9	7-8.9	9-10.9	11-12.9	13-14.9	15-16.9	17-18.9
Frequency	1	1	11	21	25	17	9	4	1

gasheated homes. An adjusted consumption value was calculated as follows.

Determine the measures of central tendency.(Arithmetic Mean, Median, Mode, Geometric Mean, Harmonic Mean, and Quadratic Mean) .

Q2: For 108 randomly selected college applicants, the following frequency distribution for entrance exam scores was obtained. Determine the measures of central tendency.(Arithmetic Mean, Median, Mode, Geometric Mean, Harmonic Mean, and Quadratic Mean)

Class limits	90 – 98	99 – 107	108 – 116	117 - 125	126 – 134
Frequency (fi)	6	22	43	28	9

Q3: Using the frequency distribution table to determine the measures of central tendency (Arithmetic Mean, Median, Mode, Geometric Mean, Harmonic Mean, and Quadratic Mean).

Daily low temperature (F)	35-39	40-44	45-49	50-54	55-59	60-64	65-69
Frequency (fi)	1	3	5	11	7	7	1

Q4: A study was conducted to determine urine flow of sheep (in milliliters / minute) when infused intravenously with the antidiuretic hormone ADH. The urine flows of 6 sheep are recorded here.

0.6 0.3 0.5 0.8 0.6 0.2

Q5: An aptitude test has a mean of 210 and a standard deviation of 10, Find the corresponding z score for each exam score; and which of the result has a better relative position?

a-202 b- 215 c- 208 d- 190 e- 222

Q6 : Find the variance and standard deviation of the following miles per gallon (mpg) obtained in 12 test runs performed on urban roads an intermediate- size car:

21.9 19.7 22.8 22.0 21.5 20.5

21.1 22.2 23.2 23.0 22.5 19.3

Q7: The authors Generac generator produces voltage amounts with a mean of 125.0 volts and a standard deviation of 0.3 volt, and the voltages have a bell-shaped distribution, what is the approximate percentage of voltage amounts between 124.4 volts and 125.6 volts?

Q8: Given a normal distribution with a mean of 45.2 and a standard deviation of 10.4, find the standard score equivalents for the following score:

a- 68.4 c- 45.2 e- 41
b- 55 d- 18.9 f- 31.5

Q9: The following data represent the number of listeners (in thousands) of 15 radio station in the 6:00 to 9:00 A.M time slot in Pittsburgh. Find each of Rang, Variance and Standard deviation.

(229, 182, 129, 112, 122, 93, 97, 114, 95, 114, 60, 89, 75, 70, 68)

Q10: If the mean value of major league teams is \$127 million and the standard deviation is \$9 million, find the corresponding z score for each teams value.

136 b- 109 c- 104.5 d- 113.5 e- 133

Q11: The senior class of a school district has a mean ACT score of 23 with a standard deviation of 4 and a mean SAT score of 1100 with a standard deviation of 150. Which test has more variability?

Q12: Two supervisor are to be selected as safety representatives within the company. Given that there are six supervisors in research and five in development, and each group of two supervisors has the same chance of being selected, find the probability of choosing both supervisors from research.

Q13: Consider the following outcomes for an experiment:

Outcome	1	2	3	4	5
Probability	0.20	0.25	0.15	0.10	0.30

Let event A consist of outcomes 1, 3, and 5, and event B consist of outcomes 4 and 5.

- a- Find $P(A)$ and $P(B)$.
- b- Find $P(\text{both A and B occur})$.

Q14: A committee in the college of engineering includes (3) surveying engineers, (2) civil engineers, and (3) electrical engineers. If one engineer was selected randomly to be the president of the committee. What is the probability to be surveying or civil engineer?

Q15: Three coins are tossed and we observe the outcome (heads or tails) for each coin

- a- List the sample space
- b- Define the events:
 - 1- Observe exactly one head.
 - 2- Observe one or more heads.
 - 3- $P(A \cap B)$.

Are events A and B independent?

Q16: A television news director wishes to use three news stories on an evening show one story will be lead story, one will be second story, and last will be a closing story. If the director has a total of eight stories to choose from how many possible ways can the program be set up?

Q17: The mean for number of pages of a sample of women s fitness magazines is 111 with a variance of 15. The mean of number advertisement of a sample of women s fitness magazines is 168, with a variance of 57. Compare the coefficients of variation.

Q18: Compute the inter quartile range and the mean deviation for the following scores:

6 , 18 , 2 , 17 , 11 , 25 , 20 , 15 , 3

Q19: A coin is flipped and a dice is rolled. Find the probability of getting a head on the coin and a 4 on the dice.

Q20: If 12 volunteers are available and 9 of them are to be selected, how many different sequences of 9 subjects are possible?

Q21: At a political rally, there are 20 Republicans, 13 Democrats, and 6 Independents. If a person is selected at random, find the probability that he or she is either a Democrat or an Independent.

Q22: The given frequency distribution describes the speeds of drivers ticketed by the town of Erbil police. These drivers were traveling through a 30 mi/ h speed zone on 30 Street Road.

Speed	42-45	46-49	50-53	54-57	58-61	62-65	66-69
Frequency (fi)	2	6	7	16	5	4	2

Determine the measures of central tendency (Arithmetic Mean, Median, Mode, Geometric Mean, Harmonic Mean, and Quadratic Mean).

Q23: In three recent years the price of copper was (69.6 , 66.8 , 66.3) cent per pound, and the price of bituminous coal was (19.43 , 19.82 , 22,4) dollars per short ton which of the two sets of prices is relatively more variable ?

Q24: Human body temperatures have a mean of 98.20F and a standard deviation of 0.62F. Convert the given:

- a- 97.5 b- 98.60 c- 98.20

Q25: A student Scored 65 on a calculus test that had a mean of 50 and a standard deviation of 10. She scored 30 on physics test with a mean of 25 and a standard deviation of 5. Compare her relative position on the two tests.

Q26: A coin is flipped and a dice is rolled. Find the probability of getting a head on the coin and a 4 on the dice.

Q27: Hospital records indicated that maternity patients staged in the hospital for the number of days shown in the distribution:

Number of days stayed	3	4	5	6	7
Frequency	15	32	56	19	5

Find the Probability:

- a- A patient stayed exactly 5 days.
b- A patient stayed less than 6 days.
c- A patient stayed at most 4 days.
d- A patient stayed at least 5 days.
-

Q28: How many combination of 4 objects are there taken 2 at a time.

Q29: An electronic controlling mechanism requires 5 distinct, but interchangeable, memory chips. In how many ways can this mechanism be assembled by placing the 5 chips in the position within the controller?

Q30: The probability that a new airport will get an award for its design is 0.16, the probability that it will get an award for the efficient use of materials is 0.24, and the probability that it will get both awards is 0.11.

- a- What is the probability that it will get at least one of the two awards?
- b- What is the probability that it will get only one of two awards?

Q31: Using the sample height and weight data given in the table below. Find the coefficient of variation for heights, then find the coefficient of variation for weights, then compare the two results.

	Mean	Standard Deviation
Height	68.34in	3.02in
Weight	172.55 Ib	26.33 Ib

Q32: Men have height with a mean of 176 cm and a standard deviation of 7cm. Charles had a height of 182cm.

a-What is the difference between Charles height and the mean?

B-Convert Charles height to a z score.

Q33: A civil Engineer monitors water quality by measuring the amount of suspended solids in a sample of river water. Over 11 weekdays, she observed:

14 12 21 28 30 63 29 63 55 19 20 suspended solids (part per million), Find the variance and standard deviation of the following:

Q34: A- In how many different ways can the director of a research laboratory choose 2 chemists from among 7 applicants and 3 physicists from among 9 applicants?

Q35: Suppose that A and B are mutually exclusive events for which $P(A) = 0.3$ and $P(B) = 0.5$.What is the probability that:

- a- Either A or B occurs?
 - b- A occurs and B does not?
 - c- Both A and B occur?
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Q36: If the probabilities are 0.87, 0.36, and 0.29 that, while under warranty, a new car will require repairs on the engine, drive train, or both, what is the probability that a car will require one or the other or both kinds of repairs under the warranty?

Q37: If 10 volunteers are available and 8 of them are to be selected, how many different Sequences of 8 subjects are possible?

Q38: The mean of the number of sales of cars over a 3-month period is 87, and the standard deviation is 5. The mean of the commissions is 5225\$, and the standard deviation is 773\$. Compare the coefficients of variation.
(10Mark)

Q39: A coin is flipped and a dice is rolled. Find the probability of getting a head on the coin and a 4 on the dice.

Q40: A box contains 3 glazed doughnuts, 4 jelly doughnuts, and 5 chocolate doughnuts. If a person selects a doughnut at random. Find the probability that it is either a glazed doughnut or a chocolate doughnut.

Q41: It is known that 30% of a certain company's washing machines require service while under warranty, whereas only 10% of its dryers need such service. If someone purchases both a washer and a dryer made by this company, what is the probability that:

1- Both machines need warranty service?

2- Neither machine needs service?

Q42: In an optics kit there are 6 concave lenses, 4 convex lenses, and 3 prisms. In how many ways can one choose one of the concave lenses, one of the convex lenses, and one of the prisms?

Q43: How many different ways can a theatrical group select 2 musicals and 3 dramas from 11 musical and 8 dramas to be presented during the year.

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