

National University of Sciences & Technology
School of Electrical Engineering and Computer Science
Department of Basic Sciences

MATH-361: Probability and Statistics (3+0): 2k20 BEE-12ABCD Fall 2022

Assignment 1	
CLO-1: Explain the basic concept of Statistics and Probability and their need in engineering/Sciences	
Maximum Marks: 10	Instructor: Ansar Shahzadi
Announcement Date: 14 th October 2022	Due Date: 25 th October 2022

Instructions:

- Understanding the question is part of the assignment and copying is not allowed.
- Express your answer in the most simplified form. Direct calculations using calculator are not allowed, you need to show the detail of your work to get the maximum marks.
- This is a group assignment. Each group having 6 members only.
- Assignment must be handwritten on A4 papers and properly bound.
- There are two pages in this assignment, including this cover page. The first page should be part of every assignment.
- Assignment is not acceptable after deadline.

Sr. No.	Students Name	CMS Id.
1		
2		
3		
4		
5		
6		

Total Marks	Marks Obtained
10	

Questions:

Questions#1

Randomly survey 30 classmates about the monthly Pocket money, height and understanding level of Probability and statistics course till the time. Record their values.

- Group these all variables five to Six Classes.
- Construct an appropriate graph for each case.
- Are the data's discrete or continuous? How do you know?
- In complete sentences, describe the shape of each graph.
- Construct box plots of all data sets and interpret it.
- Find the suitable measures of central tendency and dispersion for all data sets?
- Which variable is more consistent?

Questions#2

- Pupils were asked how long it took them to walk to school on a particular morning. A cumulative frequency distribution was formed.

Time taken (minutes)	<5	<10	<15	<20	<25	<30	<35	<40	<45
Cum. Frequency	28	45	81	143	280	349	374	395	400

- Draw a cumulative frequency curve and estimate how many pupils took less than 18 minutes.
 - 6% of the pupils took x minutes or longer. Find x.
 - Draw ogive and estimate median, 10th decile and 98th percentile.
- Calculate the coefficient of skewness and kurtosis for the following data. And discuss the result.

classes	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54
f	291	766	1287	2333	4245	6582	3995	1999

Questions#3

- Each message in a digital communication system is classified as to whether it is received within the time specified by the system design. If three messages are classified, use a tree diagram to represent the sample space of possible outcomes.
- 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 5 positions within the controller?
 - By placing 3 chips in the odd numbered positions within the controller?
- An Engineers Association consists of 5 civil engineers and 5 mechanical engineers.
 - In how many ways can a committee of 3 civil engineers and 2 mechanical engineers be appointed?

- b) If 2 civil engineers disagree with each other and refuse to be on the same committee together, how many different ways can a committee of 3 civil engineers and 2 mech
- 4) Suppose that 3 balls are placed at random into 3 cells, where more than 1 ball is allowed to occupy a cell. What are the total possibilities that all cells are occupied? List the all outcome of sample space.
- 5) Four men throw their watches into the sea, and the sea brings back to each man at random one watch. List the favorable outcome in each case.
What are the probabilities that
- a) no man gets his own watch back?
 - b) Exactly one man gets his own watch back?
 - c) At least three men gets his own watch back?
- 6) Five balls need to be placed in three boxes. Each box can hold all the five balls. In how many ways can the balls be placed in the boxes so that no box can be empty if all balls are different, but all boxes are identical?
- 7) A website randomly creates an initial password for people when they first sign up for an account. The password consists of five letters and cannot include numbers or special characters. The letters of the password cannot repeat. What is the approximate probability that a password will have no vowels? What is the approximate probability that the first letter of the password will be m?

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