



**School:** School of Engineering and Technology

**Program:** B. Tech. - C. S. E.

**Year:** 1<sup>st</sup> **Semester:** 2<sup>nd</sup>

**Examination:** End-Semester Examination

**Examination year:** May - 2023

**Course Code:** CS154

**Course Name:** Engineering Mathematics-II

**Date:** 16/5/2023

**Time:** 2:00 pm to 4:00 pm

**Total Marks:** 40

**Total Pages:** 2

**Instructions:** → Write each answer on a new page.

→ Write all the questions in the ascending order (1, 2, 3, ...) as given in the question paper.

→ Use of a calculator is permitted.

Q. N.	Question	Marks	CO	BTL
<b>Q. I.</b>	<b>Select the most appropriate option. (Write only the correct option)</b>			
1.	Which of the following is the correct range of values of probabilities? a) 0 to 1      b) -1 to 1      c) 0 to $\infty$ d) None of these	10	CO1 CO2 CO3 CO4 CO5 CO6	BTL1 BTL2
2.	If A and B are independent events, then which of the following is true? a) $P(A \cup B) = P(A) + P(B)$ b) $P(A \cup B) = 0$ c) $P(A \cup B) = P(A) + P(B) - P(A)P(B)$ d) None of these			
3.	Which of the following is correct mean of the Binomial distribution? a) np      b) $n(n-1)p^2 + np$ c) npq      d) None of these			
4.	Which of the following distribution is useful for the continuous random variable? a) Binomial      b) Poisson      c) Normal      d) None of these			
5.	What is the range of Karl Pearson's correlation coefficient? a) 0 to 1      b) -1 to 1      c) 0 to $\infty$ d) None of these			
6.	Which point is a common point in the both lines of regression? a) Origin      b) (1,1)      c) $(\bar{x}, \bar{y})$ d) None of these			
7.	A collection of all possible individuals, objects, or measurements is called _____. a) Data      b) Sample      c) Population      d) None of these			
8.	Which of the following test is useful to determine the confidence interval of population mean for small sample? a) F-test      b) t-test      c) z-test      d) $\chi^2$ -test			
9.	The error committed in rejecting a true null hypothesis is _____. a) Type-I error      b) Type-II error c) Type-III error      d) None of these			
10.	For ANOVA, the null hypothesis $H_0$ is rejected if a) $F_{cal} < F_{tab}$ b) $F_{cal} > F_{tab}$ c) $F_{cal} = F_{tab}$ d) None of these			
<b>Q. II.</b>	<b>Fill in the blanks (Write only the answer)</b>			
1.	Consider a random experiment of throwing two dice. Let A be the event that "the sum of numbers obtained on two dice is 6". Then A contains _____ number of elements.	06	CO1 CO2 CO3 CO4 CO5 CO6	BTL1 BTL2
2.	The shape of normal distribution is _____.			
3.	In the fitting of line $y = a + bx$ , the coefficient a is called _____ and the coefficient b is called _____.			
4.	A selection of some of the objects from the population is called a _____.			
5.	If the population is finite and sampling is with replacement then the variance of sampling distribution of means is given by $\sigma_x^2 =$ _____.			
6.	The calculated value in the $\chi^2$ -test of independence of attributes is $\chi^2_{cal} =$ _____.			

**Q. III. Attempt ANY 6 from the following:**

- One card is selected from a well shuffled pack of playing cards. Find the probability that a selected card is  
(i) heart, (ii) red colored, (iii) king, (iv) face card.
- The probability that an individual has a fever after getting a Covishield vaccine is 0.001. Using Poisson distribution, Determine the probability that out of 200 students vaccinated at Bhayli primary health center,  
(i) exactly 3, (ii) at least 3, (iii) at most 2 students will have a fever after having a Covishield vaccine.

3. Determine the Karl Pearson's correlation coefficient between X and Y:

X	1	3	4	6	8	9	11	14
Y	1	2	4	4	5	7	8	9

4. In the study of two variables X and Y, following information is obtained.

	X	Y
Mean	65	67
Standard Deviation	2.5	3.5

Suppose correlation coefficient is 0.8. Find the two lines of regression. Predict X if Y=0.

- What do you mean by Parameter and Statistic? List out all the sampling techniques that you learned in the class.
- A sample poll of 100 voters chosen at random from all voters in a given district indicated that 55% of them were in favor of a particular candidate. Find 95% and 99.73% confidence intervals for the proportion of all the voters in favor of this candidate. [Table values for 95% is 1.96 and for 99.73% is 3]
- A stenographer claims that she can type at the rate 120 words per minute. Can we reject her claim on the basis of 100 trials in which she demonstrates a mean of 116 words per minute with a standard deviation of 15 words. [Table value: 1.96]
- A test was taken of fifth class students of three different schools. The individual scores are given in the table below. Using ANOVA, can we say that there is no significant difference in their performance? [Table value: 3.89]

School 1	School 2	School 3
9	7	6
7	4	5
6	5	6
5	4	7
8	5	6

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C01  
C02  
C03  
C04  
C05  
C06  
BTL3  
BTL4  
BTL5