Guru Nanak Dev Engineering College, Ludhiana			
Department of Information Technology			
Program	B.Tech.(IT)	**Semester**	4
Subject Code	BSIT-101	**Subject Title**	Probability and Statistics
Mid Semester Test (MST) No.	1	**Course Coordinator(s)**	Rupinder Kaur
Max. Marks	24	**Time Duration**	1 hour 30 minutes
Date of MST	24th March, 2022	**Roll Number**	

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1	Distinguish Primary Data and Secondary Data	CO1, L2	2
Q2	In a moderately asymmetrical distribution, the mode and mean are 32.1 and 35.4.Find the value of Median.	CO1, L5	2
Q3	**From the following data solve the value of median**	CO1, L3	4
Q4	The mean and standard deviation of 200 items are found to be 60 and 20 respectively. If at the time of calculations, two items were wrongly taken as 3 and 67 instead of 13 and 17, detect the correct mean and standard deviation. Verify the correct coefficient of variation.	CO1, L4	4
Q5	**Generate Karl Pearson's coefficient of skewness from the following data**	CO5, L5	4
Q6	A. Calculate mode from the following data B. Elaborate positive and negative Correlation with suitable examples and Scatter diagram	CO1, L5	6+2=8

Marks	Less than 5	Less than 10	Less than 15	Less than 20	Less than 25	Less than 30	Less than 35	Less than 40	Less than 45
No of students	29	224	465	582	634	644	650	653	655

Profit (Rs. Lakhs)	70-80	80-90	90-100	100-110	110-120	120-130	130-140	140-150
No of Cos	12	18	35	42	50	45	30	8

Value:	0-5	5-10	10-15	15-20	20-25	25-30	30-35
Frequency:	1	2	10	4	10	9	2

Course Outcomes (CO)

Students will be able to

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Department of Information Technology			
Program	B.Tech.(IT)	**Semester**	4
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Mid Semester Test (MST) No.	2	**Course Coordinator(s)**	Rupinder Kaur
Max. Marks	24	**Time Duration**	1 hour 30 minutes
Date of MST	6 June, 2022	**Roll Number**	

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1	DistinguishType I and Type II error.	CO1, L4	2
Q2	Write properties of Binomial Distribution.	CO1, L3	2
Q3	The means of two large sample of sizes 1000 and 2000 are 168.75 cms and 170 cms respectively. Can the samples be regarded as drawn from a population with same mean and S.D 6.25 cms.	CO1, L4	4
Q4	The following are the intermediate results of two series X and Y: Mean of X=90, Mean of Y=70, N=10, $\sum x^2$=6360, $\sum y^2 = 2860, \sum xy = 3900$ (where x and y are deviations from the respective means). Find two regression equations.	CO1, L5	4
Q5	The number of defects per unit in a sample of 330 units of a manufactured product was found as follow: **No of defect:** 0 | 1 | 2 | 3 | 4 **No of units:** 214 | 92 | 20 | 3 | 1 Fit a Poisson Distribution to the data and test goodness of fit.	CO3, L3	4
Q6	A, B and C are three candidates for the post of Director in a company. Their respective chances of selection are in the ratio of 4:5:3. The probability that A, if selected will introduce the internet trading in the company is 0.30. Similarly, the probability of B and C are 0.50 and 0.60 respectively. Find the probability that the company will introduce internet trading. Also find the probability that Director B introduced the internet trading in the company.	CO1, L6	8

Total = 0.46

B = 0.4828

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Mid Semester Test (MST) No.	2	**Course Coordinator(s)**	Rupinder Kaur
Max. Marks	24	**Time Duration**	1 hour 30 minutes
Date of MST	24th May, 2023	**Roll Number**	

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1	DistinguishNull Hypothesis and Alternate Hypothesis.	CO1, L4	2
Q2	Write properties of Normal Distribution.	CO3, L1	2
Q3	The means of two large sample of sizes 1000 and 2000 are 168.75 cms and 170 cms respectively. Can the samples be regarded as drawn from a population with same mean and S.D 6.25 cms.	CO4, L3	4
Q4	A, B and C are three candidates for the post of Director in a company. Their respective chances of selection are in the ratio of 4:5:3. The probability that A, if selected will introduce the internet trading in the company is 0.30. Similarly, the probability of B and C are 0.50 and 0.60 respectively. Find the probability that the company will introduce internet trading. Also find the probability that Director B introduced the internet trading in the company.	CO6, L5	4
Q5	A sample of 9 boys had heights (inches): 45,47,50,52,48,47,53 and 51. In the light of data, discuss the suggestion that mean height of population is 47.5.	CO4, L3	
Q6	The number of defects per unit in a sample of 330 units of a manufactured product was found as follow:	CO3+CO4, L5	4

No of defect:	0	1	2	3	4
No of units:	214	92	20	3	1

Fit a Poisson Distribution to the data and test goodness of fit.

Course Outcomes (CO)

Students will be able to

1	Demonstrate the measures of central tendency to analyze the given data set
2	Create the histogram for a given data set

Please check that this question paper contains 9 questions and 2 printed pages within first ten minutes.

[Total No. of Questions:09]
Uni. Roll No. 2004899

[Total No. of Pages: 2]

Program: B.Tech. (Batch 2018 onward)
Semester: 4th
Name of Subject: Probability and Statistics
Subject Code: BSIT-101
Paper ID: 16232

Time Allowed: 03 Hours **Max. Marks: 60**

NOTE:

1) Parts A and B are compulsory
2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
3) Any missing data may be assumed appropriately
4) Scientific Calculator is allowed.

Part – A **[Marks: 02 each]**

Q1.

a) What is the difference between skewness and kurtosis?

b) What is Type I and Type II error?

c) What is the difference between correlation and regression?

d) What is sampling distribution?

e) What is mean and variance of poison distribution?

f) A bag contains 4 red balls, 3 ~~red~~ White balls and 5 green balls. A ball is drawn from the bag at random. What is the probability of getting a non red ball?

Part – B **[Marks: 04 each]**

Q2. Calculate the coefficient of correlation between X and Y for the following data.

X:	5	9	13	17	21
Y:	12	20	25	33	35

Q3. Obtain the two regression equations from the following data.

Sales:	91	97	108	121	67	124	51	73	111	57
Purchases:	71	75	69	97	70	91	39	61	80	47

Q4. What is Sampling? What is the difference between Probability and Non-Probabilty Sampling?

Q5. A pack of 50 tickets numbered 1 to 50 is shuffled and then two tickets are drawn. Find the probability that:

a. Both the tickets drawn have prime numbers.

b. None of the tickets drawn has prime numbers.

Q6. What is the difference between frequency and probability distribution? Explain in detail.

Q7. Calculate Median and Mode for the following distribution.

Production per day (in Tons)	21-22	23-24	25-26	27-28	29-30
No. of days	7	13	22	10	8

Part – C **[Marks: 12 each]**

Q8. Fit a straight line for the following data.

X:	10	20	30	40	50
Y:	22	23	27	28	30

OR

A dice is tossed 120 times with the following results:

Number turned up:	1	2	3	4	5	6	Total
Frequency:	30	25	18	10	22	15	120

Test the hypothesis that the dice is unbiased.

[Note: The table value of $\psi^2_{5\%,5} = 11.070$]

Q9. Three similar boxes have white and black balls. Box I has 1 white and 2 Black, Box II has 2 white and 1 black, Box III has 2 white and 2 black. One of the boxes is selected and a ball is chosen at random from it, which turns out to be white. Find the probability that the third box is chosen using Bayes' Theorem?

OR

a) What is the difference between Probability Distribution and Sampling Distribution?

b) Explain classical, relative and subjective approaches of Probability with example.

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Please check that this question paper contains 9 questions and 2 printed pages within first ten minutes.

[Total No. of Questions: 09]
Uni. Roll No. ...1.04.5.14

[Total No. of Pages: 02]

Program: B.Tech. (Batch 2018 onward)
Semester: 4th
Name of Subject: Probability and Statistics
Subject Code: BSIT-101
Paper ID: 16232
Scientific calculator is Allowed.

Time Allowed: 03 Hours

Max. Marks: 60

NOTE:

1) Parts A and B are compulsory.
2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice.
3) Any missing data may be assumed appropriately.

Part – A

[Marks: 02 each]

Q1.

a) Find the mean of the data: 15,20,25,19,12,11,13,17,18,20.
b) Define Null hypothesis.
c) If the regression coefficient of x on y is 0.8 and that of y on x is 0.2, what is the value of correlation coefficient between x and y?
d) Two dice are tossed once. Find the probability of getting a total of 8.
e) Check the correctness of the statement,"Mean of a B.D is 15 and variance is 5."
f) Average score of two batsman A and B are respectively 54.65, 53.4 and their standard deviation are respectively 1.68, 1.62. Which batsman is more consistent?

Part – B

[Marks: 04 each]

Q2. Calculate the Median of the data given below:

Marks	10-20	20-30	30-40	40-50	50-60	60-70
No. of students	8	11	9	25	12	16

Q3. Annual rainfall at a certain place is normally distributed with mean 45cm. The rainfalls for the last five years are 48cm, 42cm, 40cm, 44cm and 43cm. Can it be concluded that the average rainfall during the last five years is less than the normal rainfall ? (tabulated value = 2.976)

Q4. Find the rank correlation from the following data:

X	74	98	110	70	65	85	88	59
Y	121	133	170	102	90	152	160	85

P.T.O.

Q5. A can solve 90% of the problems given in a book and B can solve 75%. What is the probability that at least one of them will solve the problem , selected at random.

Q6. The probability that a bomb dropped from a plane hits the target is 1/3. If 6 bombs are dropped , find the probability that at least two will hit the target.

Q7. Fit a linear curve to the following data:

x	1	2	3	4	5
y	1	5	11	8	14

Part – C **[Marks: 12 each]**

Q8. Calculate the Karl Pearson's coefficient of correlation from the following data:

X	66	90	88	55	58	44	42
Y	58	76	65	58	53	49	56

OR

A factory produces two types of electric bulbs A and B. In an experiment relating to their life, the following results were obtained.

Length of life	10-20	20-30	30-40	40-50	50-60	60-70
Bulb A	20	18	32	40	22	18
Bulb B	13	22	40	32	18	10

Compare the Variabilities of life of two varieties using Coefficient of variation.

Q9. In a tape recorder factory, machines A, B and C manufacture respectively 50%, 30% and 20% of the total production. The percentage of the defective output of these machines are 3%, 4% and 5% . A tape recorder is selected at random and is found to be defective. Find the probability that the tape recorder was produced by machine A.

OR

Fit a Poisson distribution to the following data and calculate the expected frequencies.

x	0	1	2	3	4
f	122	60	15	2	1

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MORNING

03 OCT 2023

[Total No. of Questions: 09] [Total No. of Pages: 3]

Uni. Roll No. .....

Program: B.Tech. (Batch 2018 onward)
Semester: 4
Name of Subject: Probability and Statistics
Subject Code: BSIT-101
Paper ID: 16232
Scientific calculator is Allowed

Detail of allowed codes/charts/tables - Normal table is allowed

Time Allowed: 03 Hours **Max. Marks: 60**

NOTE:

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3) Any missing data may be assumed appropriately

Part – A **[Marks: 02 each]**

1.

(a) Find the quartile deviation from the given data: 28,18,20,24,27,30,15.

(b) Find the area under the normal curve between $z = 0$ and $z = 1.54$

(c) State the relation between the correlation and regression coefficients?

(d) Find the probability of drawing two cards king and queen from a pack of cards in two consecutive draws , the card drawn are not being replaced .

(e) Find the mean and the standard deviation of the number of heads in 100 tosses of a fair coin.

(f) If two Eigen values of a matrix are -1 and 1 . Find the third Eigen value when sum of diagonal elements of a matrix is given to be -4.

Part – B **[Marks: 04 each]**

2. Compute median from the following data:

Mid-value	5	15	25	35	45	55	65	75
Frequency	15	7	11	10	13	8	20	16

P.T.O.

3. Two salesmen A and B are working in a certain district .From a sample survey conducted by a head office, the following results were obtained. State whether there is any significant difference in the average sales between the two salesmen.

	A	B
No.of sales	20	18
Average	170	205
Standard deviation	20	25

(Given the table value of t for 36 d.f. , $t_{0.5}$ for two tailed test=1.96)

4. Obtain the regression equation of Y on X by least square method:

X	1	2	3	4	5
Y	2	3	5	4	6

5. One card is drawn at random from numbers 1 to 150 . Find the probability that it is either divisible by 3 or 5

6. Describe the different methods of primary data collection.

7. If 8 ships out of 10 arrive safely , find the probability that at least one would arrive safely out of 5 ships selected at random.

Part – C

[Marks: 12 each]

8. Calculate coefficient of Karl Pearsons coefficient of correlation from the following data:

X	100	200	300	400	500	600
Y	110	120	135	140	160	165

OR

The number of automobile accidents per week in a certain city were as follows:
12, 8, 20, 2, 14, 10, 15, 6, 9, 4. Are these frequencies in agreement with the belief that accident's numbers were the same during these 10 week period.
(Given $\chi^2_{0.05}$ for 9 d.f. =16.92).

9. The daily outputs of the three machines in a factory are in the ratio of 2:3:1.Past experience shows that 2%, 4% and 5% of the item produced by A,B and C respectively are defective. If an item is selected at random is found to be defective ,find the probability that it is produced by A or B.

OR

Fit a Binomial distribution to the following data:

X	0	1	2	3	4	5	6	7	8	9	10
Y	6	20	28	12	8	6	0	0	0	0	0

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