JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -3 EXAMINATIONS-2022
B.Tech-III Semester (BT)
COURSE CODE (CREDITS): 18B11MA312 (4)
COURSE NAME: PROBABILITY AND STATISTICAL TECHNIQUES   MAX. MARKS: 35
COURSE INSTRUCTOR: Dr. B. K. Pathak

MAX. TIME: 2 Hours

Note: All questions are compulsory. Marks are indicated against each question in square brackets. Use the appropriate statistical table given at the end of the question paper.

Q 1. Big Blossom Greenhouse was commissioned to develop an extra large rose for the Rose Bowl Parade. A random sample of blossoms from Hybrid A bushes yielded the following diameters (in inches) for mature peak blooms. 2, 3, 3, 8, 10, 10, Find the mean, sample variance and standard deviation.
[CO-1] [4]

Q 2. Assume that on an average one patient out of 15 has side effect of a new introduced drug. Find the probability that six randomly selected patients examined are   [CO-2] [5]
(a) not more than three will have side effects.
(b) at least three of them will have side effects.

Q 3. It is known that bacteria of certain kind occur in water at the rate of three bacteria/cubic cm of water. What is the probability that a sample of two cubic cm of water contain
(a) at most two bacteria.
(b) at least three bacteria.   [CO-2] [5]

Q 4. The average IQ of the adult population is 100. A researcher believes the average IQ of adults is lower than 100. A random sample of 5 adults are tested and scored 69, 79, 89, 99, 109 with a standard deviation of 15.81.   [CO-3] [5]
(a) State null and alternative hypothesis.
(b) Is there enough evidence to suggest the average IQ is lower at 5% level of significance?

Q 5. Fit a straight line to the following data considering y as the dependent variable:

x	1	2	3	4	5
y	5	7	9	10	11

[CO-4] [5]

Q 6. Two ladies were asked to rank 7 different types of lipsticks. The ranks given by them are given below:

[CO-4] [5]

Lipsticks	A	B	C	D	E	F	G
Anita	2	1	4	3	5	7	6
Sunita	1	3	2	4	5	6	7

Calculate the Spearmn's rank correlation coefficient and interpret your result.

Q 7. The internal bonding strengths of 3 different resins, ED, MD, and PF, need to be compared. Five specimens were prepared with each of the resins. [CO-5] [6]

Resin	Strength				
ED	0.99	1.19	0.79	0.95	0.90
MD	1.11	1.53	1.37	1.24	1.42
PF	0.83	0.68	0.94	0.86	0.57

Test, at level 0.05, that there is no difference between the internal bonding strengths of 3 different resins.