5. a) Find the two regression lines from the following data.

x	1	2	3	4	5	6	7	8	9
y	9	8	10	12	11	13	14	16	15

b) The sizes and means of two independent random samples are 400, 225; 3.5 and 3 respectively. Can we conclude that that samples are drawn from the same population with standard deviation 1.5?

6. Two independent samples of sizes 8 have the following values.

A	5	6	4	7	6	4	8	5
B	4	7	7	5	3	4	6	4

Find whether the difference between mean scores of two samples is significant? Test at 5% level of significance.

7. 4 coins were tossed 160 times and the following results were obtained.

$No. of\ heads$	0	1	2	3	4
$Observed\ frequencies$	17	52	54	31	6

Under the assumptions that coins are balanced, find the expected frequencies of getting $0,1,2,3,$ or 4 heads.

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Code No: E-5703/N/AICTE

FACULTY OF ENGINEERING

B.E. (CSE/CME) IV Semester (AICTE) (Backlog) (New) Examination, February/ March 2023

Time: 3 Hours | Subject: Mathematics- III | Max. Marks: 70

Note: (i) First question is compulsory and answer any four questions from the remaining six questions. Each questions carries 14 Marks.
(ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.
(iii) Missing data, if any, may be suitably assumed.

1. a) A shelf has 6 mathematics books and 4 english books. Find the probability that 3 particular mathematics books will be together.
   b) If 20% of the bolts produced by a machine are defective, determine the probability that out of 4 bolts chosen at random, 2 bolts will be defective.
   c) A random variable X has the probability density function $f(x) = \frac{c}{x^2+1}$ where $-\infty < x < \infty$. Find the constant C.
   d) Using the method of least squares, fit a straight line of the form $y = a + bx$ to the following data.

x	1	2	4
y	21	52	114

   e) Write any two applications of χ^2 – test.
   f) If a random variable X is uniformly distributed in $a \leq x \leq b$, then find its mean.
   g) Find the probability of scoring a total of 7 points at least once in two tosses of a pair of fair dice.

2. a) Suppose, a black ball has been drawn from one of the three bags, the first containing three black balls and seven white, the second five blacks balls and three white, the third eight black balls and four white. What is the probability that it is drawn from the first bag?
   b) A candidate is interviewed for 3 posts. For the first post, there are 3 candidates, for the second there are 4, and for the third are 2. What are the chances of his getting at least one post?

3. a) Find the mean and variance of Poisson distribution.
   b) If 3 % of electric bulbs manufactured by a company are defective, find the probability that in a sample of 100 bulbs, exactly five bulbs are defective.

4. a) Define exponential distribution and find its mean and variance.
   b) Let X be a random variable which follows a normal distribution with mean 42 and the standard deviation 24. Now find (i) $P(X \geq 50)$ (ii) $P(30 \leq X \leq 54)$.

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