

Department of Mathematical Sciences
Rajiv Gandhi Institute of Petroleum Technology, Jais

Tutorial Set-I

Subject: Statistical Methods & Data Analysis (MA 231)

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1. A foundry ships a lot of 20 engine blocks of which five contain internal flaws. The purchaser will select three blocks at random and test them for hardness. The lot will be accepted if no flaws are found. What is the probability that this lot will be accepted?
2. A chemist analyzes seawater samples for two heavy metals: lead and mercury. Past experience indicates that 38% of the samples taken from near the mouth of a river on which numerous industrial plants are located contain toxic levels of lead or mercury: 32% contain toxic levels of lead, and 16% contain toxic levels of mercury. What is the probability that a randomly selected sample will contain toxic levels of lead only?
3. A B.Tech student of RGIPT applies for a job in two companies X and Y. The probability of her being selected in company X is 0.7 and being rejected at Y is 0.5. The probability of at least one of her applications being rejected is 0.6. What is the probability that she will be selected in at least one of the companies?
4. Three newspapers A, B and C are published in a certain city. It is estimated from a survey that of the adult population: 20% read A, 16% read B, 14% read C, 8% read both A & B, 5% read both A & C, 4% read both B & C, 2% read all three. Find what percentage read at least one of the papers.
5. 60% of the employees of the XYZ Corporation are college graduates. Of these, 10% are in sales. Of the employees who didn't graduate from college, 80% are in sales. What is the probability that an employee selected at random i. is in sales? ii. is neither in sales nor a college graduate?
6. If A and B are two independent events then show that i. A and \bar{B} ii. \bar{A} and B are also so.
7. Two urns contain respectively 2 white & 1 black balls, and 1 white & 5 black ball. One ball is transferred from the 1st to the 2nd urn, and then a ball is drawn from the 2nd urn. What is the probability that the ball drawn is white?
8. Box I contains 3 red and 2 blue marbles while Box II contains 2 red and 8 blue marbles. A fair coin is tossed. If the coin turns up heads, a marble is chosen from Box I; if it turns up tails, a marble is chosen from Box II. Find the probability that a red marble is chosen.
9. A speaks truth 4 out of 5 times. A die is tossed. He reports that there is a six. What is the chance that actually there were six?