Question 1: Let X: B(5, 1/3), Y: Poisson (3). Assume that X and Y are independent. Find

(a) $E(X^2)$ (b) Var (3Y - 2) (c) P (Y = 4) (d) P(X = 0)

Question 2: For each of 20 questions on a True-False test. If a student answers all the questions by guessing, find the probability that he/she will get at least 10 correct answers.

Question 3: The number of accidents on a highway is Poisson distributed with an average one accident per day. Compute the probability of having at least 2 accidents in a week.

Question 4: Let X: N(10, 4) and Y: N(8, 16). Assume that X and Y are independent random variables. Find

(a) The 90th percentile of X (b) $E(3 X^2 + 7)$ (c) $P(X \geq 11| Y \leq 7)$

Question 5:
(a) Let X ~ B(100, 0.1). Find $P(7 \leq X < 11)$
(b) Let X be binomial random variable with mean 10 and Std. 3. Find P(X > 2).

Question 6: The grades in a general exam are normally distributed with mean 75 and Std. 8
(a) What is the proportion of grades that exceed 83?
(b) If four grades are selected at random, what is the probability that at least one of them will be more than 83?
(c) If 50 grades are selected at random, what is the probability that at least 7 of them will be more than 83?

Question 7: The weights of male students are normally distributed with mean 65 Kgs and Std. 4 Kgs, while the weights of female students are normally distributed with mean 60 Kgs and Std. 3 Kgs. If one male and one female are selected at random, what is the probability that their total weight will be more than 130 Kgs?

Question 8: Let X ~ N(50, 100), Y ~ t(15), U ~ χ^2_{10} and V~ F(5, 8). Find

(a) 80th percentile of X (b) 10th percentile of Y (c) 90th percentile of U

(d) 90th percentile of V (e) 10th percentile of V

Question 9: Let $X_1, X_2, \ldots, X_{12}$ be a random sample from N(60, σ^2), such that $S^2 = 9$. Find c such that $P(\overline{X} \leq c) = 0.90$.

Question 10: Let $X_1, X_2, \ldots, X_6$ be a random sample from N($\mu, \sigma^2 = 9$). If S^2 is the sample variance, find $P(S^2 < 16.63)$.