King Fahd University of Petroleum and Minerals
Faculty of Science, Department of Math. and Stat.
FINAL EXAM
MATH 131 Semester 122

Problem 1:
Find the standard deviation of the numbers 8, 15, 11, 23, 18, 35, 39, 43.

Problem 2:
The density function for a random variable X is given by

$$f(x) = \begin{cases} \frac{1}{3}x + k, & if\ 3 \leq x \leq 5 \\ 0, & otherwise. \end{cases}$$

Find (a) k, (b) $P(X \geq 4)$, (c) μ, (d) $P(3 < X < \mu)$.

Problem 3:
In a production process, the probability of a defective unit is 0.06. Suppose a sample of 15 units is selected at random. Let X be the number of defectives. Find

(a) the expected number of defective units

(b) $Var(X)$

(c) $P(X \leq 1)$. Round your answer to two decimal places.

Problem 4:
An urn contains three red and two white marbles. Two marbles are randomly drawn in succession without replacement. Let X be the number of red marbles drawn. Find the distribution f for X.

Problem 5:
If a fair die is rolled two times in succession. Find the probability of getting a total greater than 7, given that the first roll is greater than 3.

Problem 6:
From a group of two women and three men, two persons are selected at random to form a committee. Find the probability that the committee consists of women only.

Problem 7:
A red die and a green die are thrown, and the numbers of each are noted. Which pairs of the following events are mutually exclusive?

E={both are even}, F={both are odd}, G={sum is 2}, H={sum is 4}, I={sum is greater than 10}.

Problem 8:
In how many ways it is possible to answer a 12-question true-false examination?

Problem 9:
Find the future value of the annuity: $2000 every six months for 10 years at the rate of 6% compounded semiannually.

Problem 10:
A debt of $2000 due in three years and $3000 due in seven years is to repaid by a single payment of $1000 now and two equal payments that are due one

year from now and four years from now. If the interest rate is 6% compounded annually, how much are each of the equal payments?