1. A woman is asked to make a donation. She has a quarter, a silver dollar, a five, a ten and a twenty dollar bill. If she wishes to give something, in how many ways can she do so?

   a. 35 b. 63 c. 18 d. 5 e. 31

2. A factory makes 100 cars in one day. Seventy have air conditioning, thirty have power brakes and twenty have neither. How many have both air conditioning and power brakes?

   a. 10 b. 20 c. 30 d. 40 e. none

3. An exam consists of five "true or false" questions. How many of the 32 possible ways of answering these questions contain three or more correct answers?

   a. 20 b. 16 c. 15 d. 12 e. 9

4. Two dice are rolled and the product of the numbers of dots on the faces is noted. The probability that the product is four is.

a. $\frac{1}{18}$ b. $\frac{1}{9}$ c. $\frac{1}{6}$ d. $\frac{1}{12}$ e. $\frac{1}{36}$

5. A club can elect a member as president and a different member as treasurer in a total of 72 different ways. How many members are in this club?

a. 16 b. 23 c. 9 d. 5 e. 19

6. If the probability of E occurring is $\frac{1}{2}$, the probability of F occurring is $\frac{1}{3}$ and E and F are independent events, calculate Pr(E|F).

a. $\frac{1}{2}$ b. $\frac{1}{3}$ c. $\frac{5}{6}$ d. $\frac{1}{6}$ e. $\frac{2}{3}$

7. If the probability of E occurring is $\frac{1}{2}$, the probability of F occurring is $\frac{1}{3}$ and E and F are mutually exclusive, calculate Pr(F|E).

a. $\frac{1}{3}$ b. $\frac{1}{2}$ c. $\frac{1}{6}$ d. $\frac{2}{3}$ e. 0

8. A jar contains eight red balls and two green balls. A sample of three balls is randomly selected. The probability that the sample contains at least one green ball is.

a. $\frac{1}{3}$ b. $\frac{8}{15}$ c. $\frac{11}{15}$ d. $\frac{3}{5}$ e. $\frac{2}{3}$

9. A scientist develops 3 independent tests for AIDS.

The chances of test I correctly diagnosing an infected person is 90%

The chances of test II correctly diagnosing an infected person is 80%

The chances of test III correctly diagnosing an infected person is 50%

What is the probability that an infected person who is given all three tests is given a clean bill of health on each test?

a. $\frac{1}{100}$ b. $\frac{1}{360}$ c. $\frac{1}{125}$ d. $\frac{7}{10}$ e. 0

10. An ordinary quarter and a fake quarter with two heads are placed in a hat. One is selected at random and tossed twice. Find the probability that the outcome is HH. (Hint: draw a tree diagram.)

a. $\frac{3}{8}$ b. $\frac{1}{2}$ c. $\frac{1}{8}$ d. $\frac{5}{8}$ e. $\frac{1}{4}$

11. (Continued from question 10). Suppose the outcome was HH. What is the probability that the coin was fake?

a. $\frac{3}{4}$ b. $\frac{1}{5}$ c. $\frac{5}{8}$ d. $\frac{1}{2}$ e. $\frac{4}{5}$

12. A number of people apply for a job at a University. The table below gives the percentages of various applicants and probabilities of acceptances. If a person is given a position what is the probability that this person is American?

Applicant	% apply	Probability of acceptances	Product
European	30	.30	.090
American	15	.30	.045
Asian	20	.20	.070
Other	35	.20	.070
		TOTAL	0.245

a. $\frac{9}{49}$ b. $\frac{5}{49}$ c. $\frac{6}{49}$ d. $\frac{1}{7}$ e. $\frac{3}{14}$

13. A random variable has the following probability distribution.

outcome k	P(X = k)
−1	.2
0	.1
1	.3
2	.4

What is $P(X^2 = 1)$?

a. .3 b. .2 c. .5 d. .6 e. .06

14. A die is rolled and X is the number of spots shown. What is the expected value of the random variable X?

a. 3.5 b. 3 c. 2.5 d. 21 e. 6

15. A cancer test is 99% accurate for both infected and non-infected persons. Suppose that .01 of the population has this type of cancer. If you take the test and get a positive result what is the probability that you have this cancer?

a. $\frac{1}{10}$ b. $\frac{9}{10}$ c. $\frac{2}{3}$ d. $\frac{1}{2}$ e. $\frac{1}{4}$