1. The GMAT scores from a sample of 50 applicants to an MBA program indicate that none of the applicants scored below 450. A frequency distribution was formed by choosing class intervals 450 but less than 500, 500 but less than 550, and so on, with the last class having an interval from 700 but less than 750. Two applicants scored in the interval 450 but less than 500, and 16 applicants scored in the interval 500 but less than 550. In addition, 4 applicants scored in the interval 700 but less than 750. What percentage of applicants scored between 550 and 700?

   (a) 56%
   (b) 44%
   (c) 52%
   (d) 60%
   (e) 64%

2. The Energy Information Administration reported the percentage of electricity generation in the United States in 2010 from the following sources: coal (44%), hydroelectric (7%), natural gas (24%), nuclear (20%), and other sources (5%). Which graphical method do you think is best for portraying these data?

   (a) Pareto chart, because it displays the categories in descending order of their percentages and makes comparisons among sources easier.
   (b) Pie chart, because it displays the data in alphabetical order and makes exact comparisons easier.
   (c) Histogram, because the data represent a continuous variable.
   (d) Stem-and-leaf plot, because it preserves the individual observations.
   (e) Time-series plot, because the data were collected over several years.

3. The operations manager of a plant that manufactures tires wants to compare the relative variability of the inner diameters of two grades of tires. A sample of five tires from each grade was selected, and the results are shown below.

Grade X (mm)	Grade Y (mm)
573	1136
574	1140
575	1150
577	1156
578	1168

Which grade of tire exhibits greater relative variability?

(a) Grade Y, because it has the larger coefficient of variation.

(b) Grade X, because its measurements are closer to the target diameter.

(c) Grade X, because its mean diameter is smaller than that of Grade Y.

(d) Both grades have the same relative variability because they have the same sample size.

(e) Relative variability cannot be compared because the two grades have different mean diameters.

4. A bank recorded the waiting times (in minutes) of 15 customers during the lunch hour:

4.21, 5.55, 3.02, 5.13, 4.77, 2.34, 3.54, 3.20, 4.50, 6.10, 0.38, 5.12, 6.46, 6.19, 3.79

What percentage of the waiting times falls within one standard deviation of the mean?

(a) 66.7%

(b) 53.3%

(c) 60.0%

(d) 73.3%

(e) 80.0%

5. The following data represent the overall miles per gallon (MPG) for 26 small SUVs from the 2010 model year. The MPG values, sorted from smallest to largest, are given below:

   16, 16, 18, 18, 18, 19, 19, 19, 19, 21, 21, 21, 21, 21, 21, 21, 22, 22, 22, 22, 22, 23, 24, 26, 26, 26

   The five-number summary for the MPG data is

   (a) (16, 19, 21, 22, 26)
   (b) (16, 18, 21, 22, 26)
   (c) (16, 19, 22, 23, 26)
   (d) (18, 19, 21, 22, 26)
   (e) (16, 19, 21, 23, 24)

6. Consider the following scenarios:

   I. A KFUPM student is an undergraduate student and a graduate student at the same time.

   II. A KFUPM student is female and enrolled in a mathematics course.

   III. A car parked on campus is a Ford and a Toyota.

   IV. A car parked on campus is a Toyota and was manufactured in Japan.

   Which of the above events occur with a probability of zero?

   (a) I and III only
   (b) I and II only
   (c) II and IV only
   (d) III and IV only
   (e) I, III, and IV only

7. A study of new cars found that the probability that a car requires a warranty repair is 4%, the probability that it was manufactured by a U.S.-based company is 60%, and the probability that it was manufactured by a U.S.-based company given that it requires a warranty repair is 62.5%. Find the probability that the car requires a warranty repair or was not manufactured by a U.S.-based company.

   (a) 0.425
   (b) 0.385
   (c) 0.440
   (d) 0.615
   (e) 0.975

8. In a follow-up survey of 300 households that purchased big-screen televisions, households were asked whether they were satisfied with their purchase. The table below summarizes the results by television refresh rate.

Television Refresh Rate	Satisfied (Yes)	Satisfied (No)	Total
Faster	64	16	80
Standard	176	44	220
Total	240	60	300

   Suppose 2 households are randomly selected from the 80 households with faster refresh-rate televisions. What is the probability that both households are satisfied with their purchase?

   (a) 0.63797
   (b) 0.63946
   (c) 0.66445
   (d) 0.80000
   (e) 0.75000

9. Base Construction Company submits bids 70% of the time. If Base Construction Company does not bid, Olive Construction Company gets the job with probability 0.50. If Base Construction Company does bid, Olive Construction Company gets the job with probability 0.25. What is the probability that Olive Construction Company gets the job?

   (a) 0.325
   (b) 0.250
   (c) 0.350
   (d) 0.450
   (e) 0.675

10. The probability distribution for the number of arrivals per minute at a bank is given below.

x	0	1	2	3	4	5	6	7	8
$P(X = x)$	0.07	0.155	0.235	0.205	0.145	0.105	0.05	0.025	0.01

   What is the standard deviation of the number of arrivals per minute?

   (a) 1.77
   (b) 3.14
   (c) 2.90
   (d) 1.70
   (e) 11.55

11. A stock's closing price can either increase or decrease each trading day. Assume that an increase and a decrease are equally likely and that daily price changes are independent. Given that the stock's closing price increased on at least 3 of the next 5 trading days, what is the probability that it increased on exactly 4 of the 5 days?

    (a) 0.3125
    (b) 0.5
    (c) 0.03125
    (d) 0.15625
    (e) 0.6875

12. A toll-free phone number is available for customers to register complaints about a product. Past history indicates that an average of 0.8 calls is received per minute. Assume that the number of calls received per minute follows a Poisson distribution. What is the probability that three or more phone calls will be received in a two-minute period?

    (a) 0.2166
    (b) 0.2019
    (c) 0.2584
    (d) 0.3230
    (e) 0.0474

13. You are helping a client choose bond mutual funds for an investment portfolio. There are 10 different funds to choose from, and 4 will be selected. Six of the funds are short-term corporate bond funds. What is the probability that at most one of the selected funds is short-term corporate bond funds?

    (a) 0.1190

    (b) 0.0048

    (c) 0.1143

    (d) 0.5476

    (e) 0.8810

14. Which of the following statements could represent a valid probability mass function (PMF) for a discrete random variable?

    (a) If the probability that a learner passes a driver's test is 0.70, then the probability that the learner fails the test is 0.30.

    (b) If the probability of obtaining a defective item is 0.25, then the probability of obtaining a nondefective item is 0.80.

    (c) A discrete random variable has probabilities 0.15, 0.25, 0.35, and 0.40 for its possible outcomes.

    (d) A discrete random variable assigns probabilities -0.10, 0.50, and 0.60 to its outcomes.

    (e) A discrete random variable assigns probabilities 0.20, 0.30, and 0.60 to its outcomes.