* **Question 1**

0 out of 1 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | A quiz has six multiple-choice questions.  Each question has five possible answers.  A student is unprepared and has no choice but to guess all the answers, completely at random.  What is the probability that the student will get exactly 4 answers correctly? |  |  |  |
| |  |  | | --- | --- | | Selected Answers: | Incorrect | | Correct Answers: | Correct | |  |  |  |

* **Question 2**

1 out of 1 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | Suppose that the probability that any random student graduates with honors is 0.07.  Also, we know that the probability of a student getting into grad school, given that they graduated with honors is 0.70.  The probability of a student getting into grad school, given that they did not graduate with honors is 0.05.  What is the probability that any random student does *not* get into graduate school? |  |  |  |
| |  |  | | --- | --- | | Selected Answers: | Correct  0.9045 | | Correct Answers: | Correct  0.9045 | |  |  |  |

* **Question 3**

0 out of 1 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | Suppose that the probability that any random student graduates with honors is 0.07.  Also, we know that the probability of a student getting into grad school, given that they graduated with honors is 0.70.  The probability of a student getting into grad school, given that they did not graduate with honors is 0.05.  What is the probability that a student did *not* graduate with honors, given that the student did get in to graduate school? |  |  |  |
| |  |  | | --- | --- | | Selected Answers: | Incorrect  0.0514 | | Correct Answers: | Correct  0.487 | |  |  |  |

* **Question 4**

1 out of 1 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | Consider a random variable *X,*that takes values 0,1, and 2 with probabilities *P*(*X* = 0) = *P*(*X*= 1) = 0.25 and P(*X* = 2) = 0.5.   Then, *X* = 0 with probability 0.25, *X* = 1 with probability 0.25, and *X* = 2 with probability 0.5.  What is the expected value of *X*? |  |  |  |
| |  |  | | --- | --- | | Selected Answers: | Correct  1.25 | | Correct Answers: | Correct  1.25 | |  |  |  |

* **Question 5**

1 out of 1 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | Consider a random variable *X,* that takes values 0,1, and 2 with probabilities *P*(*X* = 0) = *P*(*X* = 1) = 0.25 and P(*X* = 2) = 0.5.   Then, *X* = 0 with probability 0.25, *X* = 1 with probability 0.25, and *X* = 2 with probability 0.5.  What is the variance of *X*? |  |  |  |
| |  |  | | --- | --- | | Selected Answers: | Correct  0.6875 | | Correct Answers: | Correct  0.6875 | |  |  |  |

* **Question 6**

1 out of 1 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | Let *X*be a random variable that has value 1 on “heads” (H) and 2 on “tails” (T), for the toss of a fair coin. Suppose we have a second coin that is biased with ‘H’ having a probability of 1/3 and ‘T’ having a probability 2/3. Let *Y* be a random variable that has value 1 on a ‘H’ with this biased coin, and value 2 on a ‘T’ with this biased coin. What is the joint probability distribution of *X* and *Y*? |  |  |  |
| |  |  | | --- | --- | | Selected Answers: | Correct  *f*(1,1) = 1/6 *f*(1,2) = 1/3 *f*(2,1) = 1/6 *f*(2,2) = 1/3 | | Correct Answers: | Correct  *f*(1,1) = 1/6 *f*(1,2) = 1/3 *f*(2,1) = 1/6 *f*(2,2) = 1/3 | |  |  |  |

* **Question 7**

1 out of 1 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | Suppose that Windows is installed in a public library that is used by random people in a random order.  Suppose that 20 users used the computer and 13 of those closed Windows properly.   Suppose we choose a random sample of the users of size 5.  How many of those 5 users, are expected to have closed Windows properly? |  |  |  |
| |  |  | | --- | --- | | Selected Answers: | Correct  3.25 | | Correct Answers: | Correct  3.25 | |  |  |  |

* **Question 8**

1 out of 1 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | About 20% of users do not close Windows properly.  Suppose that Windows is installed in a public library that is used by random people in a random order.  At which place in the order would we expect to see the first user that does not close Windows properly? |  |  |  |
| |  |  | | --- | --- | | Selected Answers: | Correct  5 | | Correct Answers: | Correct  5 | |  |  |  |

* **Question 9**

1 out of 1 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | Let *n*be the number of trials and *p* be the probability of success in the binomial distribution.  Under which conditions do the Binomial and Poisson distributions give approximate results? |  |  |  |
| |  |  | | --- | --- | | Selected Answers: | Correct  *n* → ∞, *p* → 0 | | Correct Answers: | Correct  *n* → ∞, *p* → 0 | |  |  |  |

* **Question 10**

1 out of 1 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | A manufacturer produces rolls of wallpaper.  A flaw occurs when the pattern is inconsistent.  A 20 meter sample from each roll is inspected.  It is believed that the number of flaws per sample follows a Poisson distribution with a mean of one flaw per 20 meter sample.  What is the probability that at least three flaws will appear in a 20 meter sample? |  |  |  |
| |  |  | | --- | --- | | Selected Answers: | Correct  0.0803 | | Correct Answers: | Correct  0.0803 | |  |  |  |

* **Question 11**

1 out of 1 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | A company estimates that the probability of having some employee off on any one day is 0.15.  What is the probability that the company experiences five consecutive days without a worker off sick? |  |  |  |
| |  |  | | --- | --- | | Selected Answers: | Correct  0.444 | | Correct Answers: | Correct  0.444 | |  |  |  |

* **Question 12**

1 out of 1 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | A company estimates that the probability of having some employee off on any one day is 0.10.  What is the probability that in a seven-day period, the company will have at least 2 days with workers off sick? |  |  |  |
| |  |  | | --- | --- | | Selected Answers: | Correct  0.150 | | Correct Answers: | Correct  0.150 | |  |  |  |

* **Question 13**

1 out of 1 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | The subs at your local sandwich shop have an average length of 12 inches and a standard deviation of 0.5 inches.  Assuming that the lengths are *normally distributed*, what percentage of the subs that are sold are between 11.5 and 12.5 centimeters in length? |  |  |  |
| |  |  | | --- | --- | | Selected Answers: | Correct  0.6826 | | Correct Answers: | Correct  0.6826 | |  |  |  |

* **Question 14**

0 out of 1 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | In the November 1990 issue of *Chemical Engineering Progress*, a study discussed the percent purity of oxygen from a certain supplier.  Assume that the mean was 78.7 with a standard deviation of 0.07.  Assume that the distribution of percent purity was approximately *normal*.  What purity value would you expect to exceed 12% of the population? |  |  |  |
| |  |  | | --- | --- | | Selected Answers: | Incorrect  78.78225 | | Correct Answers: | Correct  78.61775 | |  |  |  |

* **Question 15**

0 out of 1 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | The heights of 1000 students are approximately normally distributed with a mean of 174.5 cm and a standard deviation of 6.9 cm.  Suppose 200 random samples of size 25 are drawn from this population.  Determine the number of sample means that are expected to fall between 172.5 and 175.8 cm inclusive. |  |  |  |
| |  |  | | --- | --- | | Selected Answers: | Incorrect  154 | | Correct Answers: | Correct  151 | |  |  |  |

* **Question 16**

1 out of 1 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | The amount of time that a drive-through bank teller spends on a customer is a random variable with a mean  minutes and a standard deviation  minutes.  If a random sample of 25 customers is observed, find the probability that their mean time at the teller’s window is more than 3.5 minutes.  Assume that the distribution is approximately normal. |  |  |  |
| |  |  | | --- | --- | | Selected Answers: | Correct  0.1587 | | Correct Answers: | Correct  0.1587 | |  |  |  |

* **Question 17**

1 out of 1 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | What is the value of *t0.025* when the sample size that has been taken is *n* = 14. |  |  |  |
| |  |  | | --- | --- | | Selected Answers: | Correct  2.160 | | Correct Answers: | Correct  2.160 | |  |  |  |

* **Question 18**

1 out of 1 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | An electrical firm manufactures light bulbs that have a length of life that is approximately normally distributed with a standard deviation of 40 hours.  If a sample of 30 bulbs has an average life of 780 hours, find a 95% confidence interval for the population mean of all bulbs produced by this firm. |  |  |  |
| |  |  | | --- | --- | | Selected Answers: | Correct  765.69 < µ < 794.31 | | Correct Answers: | Correct  765.69 < µ < 794.31 | |  |  |  |

* **Question 19**

1 out of 1 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | An electrical firm manufactures light bulbs that have a length of life that is approximately normally distributed with an unknown standard deviation.  If a sample of 30 bulbs has an average life of 780 hours and a sample standard deviation of 50 hours, find a 95% confidence interval for the population mean of all bulbs produced by this firm. |  |  |  |
| |  |  | | --- | --- | | Selected Answers: | Correct  761.33 < µ < 798.67 | | Correct Answers: | Correct  761.33 < µ < 798.67 | |  |  |  |

* **Question 20**

1 out of 1 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | An electrical firm manufactures light bulbs that have a length of life that is approximately normally distributed with a standard deviation of 40 hours.  How large a sample is needed if we wish to be 95% confident that our sample mean will be within 10 hours of the true mean? |  |  |  |
| |  |  | | --- | --- | | Selected Answers: | Correct  62 | | Correct Answers: | Correct  62 | |  |  |  |

* **Question 21**

1 out of 1 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | A sports analyst claims that 40% of all high school athletes in the country, end up playing sports in college.  To test this claim, a large sample of high school athletes is inspected; the proportion of these athletes, which will also play sports in college, is recorded and used as the test statistic.  What are the appropriate null and alternative hypotheses for this test? |  |  |  |
| |  |  | | --- | --- | | Selected Answers: | Correct  H0: p = 0.6      H1: p ≠0.6 | | Correct Answers: | Correct  H0: p = 0.6      H1: p ≠0.6 | |  |  |  |