Probability 2 Numerical Outcomes

1. What is the key feature of a random variable?
   1. There can be several possible values
   2. Each possible value has a known probability
   3. Values can change with different conditions
   4. Values occur completely by chance
2. Which of the following is a discrete random variable?
   1. The number of accidents at a particular road junction each day
   2. The most popular colour of car
   3. The amount of time a customer has to wait in the bank
   4. The height of students in a particular class
3. Which of the following is a continuous random variable?
   1. The number of boys in a family of 3 children
   2. The nationality of students in a particular class
   3. The proportion of students who pass an exam
   4. The suit of a playing card selected at random
4. What does a discrete probability distribution usually look like?
   1. an equation
   2. a table of probabilities
   3. a histogram
   4. a line graph
5. If a discrete random variable, X, can take the values 1, 2, 5, and 10 with equal probability, what is the probability of a value 2?
   1. 0
   2. 0.25
   3. 0.5
   4. 0.75
6. If a discrete random variable, X, can take the values 1, 2, 5, and 10 with equal probability, what is the probability of a value 3?
   1. 0
   2. 0.25
   3. 0.5
   4. 0.75
7. If a discrete random variable, X, can take the values 1, 2, 5, and 10 with equal probability, what is the expected value of X?
   1. 4
   2. 4.5
   3. 5
   4. 3.5
8. What is the equation for the expected value of a discrete random variable x?
   1. ∑P(x)
   2. ∑xP(x)
   3. ∑P(x) / (n-1)
   4. P(x) × ∑x / n
9. If x has the following probability distribution, what is the expected value of x?  
   1 0.2  
   2 0.4  
   3 0.4  
   Which of the following statements is true?
   1. E(x) = 1.8
   2. E(x) = 2
   3. E(x) = 2.2
   4. E(x) = 2.4
10. If x has the following probability distribution, what is the expected value of x?  
    1 0.2  
    2 0.4  
    3 0.4, what is the expected value of x2?
    1. E(X2) = 4.84
    2. E(X2) = 4
    3. E(X2) = 5.2
    4. E(X2) = 5.4
11. What is the equation for the variance of a random variable x?
    1. E(x)
    2. E(x-μ)
    3. [ E(x-μ) ]2
    4. E[ (x-μ)2 ]
12. According to Chebysheff’s rule, what proportion of observations are generally within 2 standard deviations of the mean?
    1. 25% of them
    2. 50% of them
    3. 75% of them
    4. all of them
13. If a random variable has mean 20 and standard deviation 2, which of the following is the most accurate statement about the probability that it takes a value greater than 26?
    1. it is more than 1/4
    2. it is exactly 1/9
    3. it is about 1/18
    4. it is at least 1/3
14. What is the expected value of the following probability distribution?

3 0.5

4 0.3

5 0.2

* 1. 3.7
  2. 4.3
  3. 4
  4. 3

1. What is the variance of the following probability distribution?

3 0.5

4 0.3

5 0.2

1. 0.5
2. 0.61
3. 2
4. Some other value

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| Question | Answer |
| 1 | D |
| 2 | B |
| 3 | C |
| 4 | B |
| 5 | B |
| 6 | A |
| 7 | B |
| 8 | B |
| 9 | C |
| 10 | D |
| 11 | D |
| 12 | C |
| 13 | C |
| 14 | A |
| 15 | B |