

Question 1  
Not yet answered  
Points out of 1.00

A gambling book recommends the following "winning strategy" for the game of roulette. It recommends that a gambler bet \$1 on red.

If red appears (which has probability  $18/38$ ), then the gambler should take her 1 dollar profit and quit. If the gambler loses this bet (which has probability  $20/38$  of occurring), she should make additional 1 dollar bets on red on each of the next two spins of the roulette wheel and then quit. Let  $X$  denote the gambler's winnings when she quits. What is the expected value of  $X^2$ ?

$$X^2 = -9 \cdot \frac{20}{38} + 2 \left(\frac{20}{38}\right)^2 \frac{18}{38} + \frac{20}{38} \left(\frac{18}{38}\right)^2 + \frac{18}{38}$$

Select one:

- a. 2.16635
- b. 10.112091
- c. 0.9811
- d. 0.1325
- e. -0.1080331

Question 2  
Not yet answered  
Points out of 1.00

A binary communication channel carries data as one of two sets of signals denoted by 0 (zero) and 1. Owing to noise, a transmitted 0 is sometimes received as a 1, and a transmitted 1 is sometimes received as a 0. For a given channel, it can be assumed that a transmitted 0 is correctly received with probability 0.95 and a transmitted 1 is correctly received with probability 0.75. Also, 70% of all messages are transmitted as a 0. If a signal is sent, determine the probability that a 1 was received.

$$0 - 0.25 \quad 0 \quad 0.70$$

$$1 \quad 0.25 \quad 1 \quad 0.30 \quad -0.75$$

$$.70 \quad 1$$

Select one:

- a. 0.11
- b. 0.678
- c. 0.74
- d. 0.26
- e. 0.61

Question 3  
Not yet answered  
Points out of 1.00

Suppose that you and a friend are matching balanced coins (i.e., each coin has probability  $1/2$  of landing head). Each of you tosses a coin. If the upper faces match, you win 1.00 dollar; if they do not match, you lose 1.00 dollar (your friend wins 1.00 dollar). The probability of a match is 0.5. Let  $X$  = your winnings. The variance of  $X$  is

$$-1 \quad 1 \quad 0$$

$$\frac{1}{2} \quad \frac{1}{2} \quad \frac{1}{4}$$

$$e =$$

Select one:

- a. 0.5
- b. 0
- c. 1
- d. 0.25
- e. 8

Question 4

Not yet answered

Points out of 1.00

A certain firm produces resistors and markets them as 10-ohm resistors. However, the actual ohms of resistance produced by the resistors may vary. Research has established that 5 percent of the values are below 9.5 ohms and 10 percent are above 10.5 ohms. If two resistors, randomly selected, are used in a system, find the probability that both resistors have actual values between 9.5 and 10.5 ohms.

- Select one:
- a. 0.4198
  - b. 1.6
  - c. 0.7225
  - d. 0.0225
  - e. 0.2775

9.5                      10.5  
5%                      10%

Question 5

Not yet answered

Points out of 1.00

22% of the customers visiting the suit department of a certain store will purchase a suit, 30% will purchase a shirt and 28% will purchase a tie. 11% of customers purchase a shirt and a suit, 14% both a suit and a tie and 10% buy a shirt and a tie. Only 6% of customers buy all three items. Let A be the event that the customer purchases a suit, B the event that the customer purchases a shirt and C the event that the customer purchases a tie. If there are 1000 customers in the store one week, how many will purchase exactly one of these items?

- Select one:
- a. 740
  - b. 490
  - c. 560
  - d. 280
  - e. 840

Suit 22                      shirt suit 11  
shirt 30                      14 suit tie  
tie 28                      10 shirt tie  
  
6 all

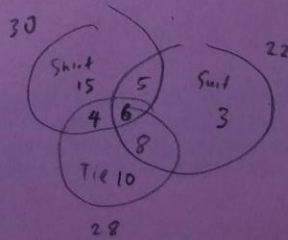
Question 6

Not yet answered

Points out of 1.00

Each child born to a particular set of parents has probability 0.25 of having blood type O. If these parents have 5 children, what is the probability that exactly 2 of them have type O blood?

- Select one:
- a. 0.732
  - b. 1.345
  - c. 0.4562
  - d. 0.62
  - e. 0.2636



Question 7

Not yet answered

Points out of 1.00

Enquiries to an on-line computer system arrive on 5 communication lines. The percentage of messages received through each line are:

Line	1	2	3	4	5
% received	20	30	10	15	25

From past experience, it is known that the percentage of messages exceeding 100 characters on the different lines are:

Line	1	2	3	4	5
% Exceeding 100 characters	40	60	20	80	90

What is the overall proportion of messages exceeding 100 characters?

Select one:

- a. 0.375
- b. 0.2919
- c. 250.4%
- d. 0.7081
- e. 0.625

Question 8

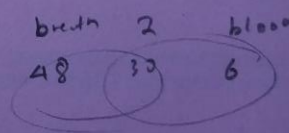
Not yet answered

Points out of 1.00

Police report that 78% of drivers stopped on suspicion of drunk driving are given a breath test, 36% a blood test, and 30% both tests. What is the probability that a randomly selected DWI (Driving While Intoxicated) suspect is given a blood test or a breath test, but not both?

Select one:

- a. 0.54
- b. 0.77
- c. 0.5
- d. 0.89
- e. 0.31





Question 9  
Not yet answered  
Points out of 1.00

An appliance dealer sells three different models of upright freezers having 13.5, 15.9, and 19.1 cubic feet of storage space, respectively. Let  $X$  = the amount of storage space purchased by the next customer to buy a freezer. Suppose that  $X$  has pmf (probability mass function)

$x$	13.5	15.9	19.11	
$P(x)$	0.2	0.5	0.3	16.383

If the price of a freezer having capacity  $X$  cubic feet is  $17X + 180$ , what is the expected price paid by the next customer to buy a freezer?

Select one:

- a. 278.46
- b. 1002.44
- c. 16.383
- d. 458.511
- e. 12.15

Question 10  
Not yet answered  
Points out of 1.00

A system with 6 independent components is such that the system will fail if at least one of the individual components fail. The probability that a component fails is 0.02. Let  $A$  be the event that the system fails. What is the probability of  $A$ ?

all must work  
0.98 succeed

Select one:

- a. 0.999999
- b. 0.1141576
- c. 0.6672142
- d. 0.511
- e. 0.8858424

Question 11  
Not yet answered  
Points out of 1.00

A total of 46 percent of the voters in a certain city classify themselves as Independents, whereas 30 percent classify themselves as Liberals and 24 percent as Conservatives. In a recent local election, 35 percent of the Independents, 62 percent of the Liberals, and 58 percent of the Conservatives voted. What proportion of the voters who voted in the local election are conservative?

46 ind 35  
30 lib 62  
24 cons 58

Select one:

- a. 0.2863019
- b. 0.331
- c. 0.383
- d. 0.4862
- e. 0.1392

Question 12  
Not yet answered  
Points out of 1.00

Consider four computer firms A, B, C and D bidding for a certain contract. A survey of past bidding success of these firms shows the following probabilities of winning:  
 $P(A)=0.35$ ;  $P(B)=0.15$ ;  $P(C)=0.3$ ;  $P(D)=0.2$   
 Before the decision is made to award the contract, firm B withdraws the bid. Find the new probabilities of winning the bid for A, C, D, respectively.

Select one:

- a. 0.41117647, 0.3529412, 0.232941
- b. 0.35, 0.3, 0.2
- c. 0.5, 0.25, 0.25
- d. 0.211391, 0.32194, 0.466669
- e. 0.33333, 0.33333, 0.33333

Question 13  
Not yet answered  
Points out of 1.00

Computer chips coming off an assembly line are tested for quality and are rated defective (d) or good (g).  
 A quality control inspection carried out every hour tests the chips until a run of two consecutive chips are defective or until four chips have been tested, whichever occurs first.

The sample space S for this experiment is  $S = \{dd, gd, dgd, dg, dgg, ggd, ggg, ggd, ggg\}$

The probability that a chip is defective is 0.02.

We define a random variable Y as the number of defectives found in the quality control inspection. The expected value of the random variable Y is, approximately,

Select one:

- a. 1
- b. 2
- c. 1.542013
- d. 0.0799468
- e. 0

0  $0.98^4$   
 1  $0.98^3(0.02) \cdot 4$   
 2  $0.98^2(0.02)^2 + (0.02)^2 = 0.98(0.02)$   
 3  $0.98(0.02)^2$

Question 14  
Not yet answered  
Points out of 1.00

Let A be the event that a family that has 3 children has children of both sexes, and let B be the event that such a family has at most one boy. The events A and B are: (choose one)  
 (Note: you may assume that there is a fifty fifty chance of being a boy or a girl).

Select one:

- a. Mutually exclusive (or disjoint)
- b. Not independent
- c. Independent
- d. Empty

BBG GGB G18  
 BGB GBG  
 GBB GGB  
 (3/8)

Question 15

Not yet answered  
Points out of 1.00

Suppose that one half of the messages received at a university are spam. 70% of spam messages contain the sentence: "your participation is required" in the subject line. In messages that are not spam, that sentence only appears 10% of the time in the subject line.

A spam filter, like those in your mail program, is instructed to reject messages that exceed probability 0.8 of being spam.

A message arrives with the sentence "your participation is required" in the subject line. What is the probability that the message is spam?

1/2  
0.5 spam → 0.7 has  
not spam → 0.1 has  
0.

Select one:

- a. 0.875
- b. 0.35
- c. 0.5
- d. 0.125
- e. 0.4

Question 16

Not yet answered  
Points out of 1.00

A system consists of five independent components in parallel. The system will work if at least one of the five components works. Let  $C_i$  represent the event that component  $i$  works,  $i = 1, \dots, 5$ .  $P(C_i) = 0.97$  for all  $i$ . What is the probability that the system will work (also known as the reliability of the system)?

Select one:

- a. 1
- b. 0.86
- c. 0.1
- d. 0.14126
- e. 0.45

0.39  
5 | 0  
238  
0.23

Question 17

Not yet answered  
Points out of 1.00

In a population of 1669 people  
238 smoke and are divorced )  
247 smoke and are not divorced )  
374 Do not smoke and are divorced )  
810 do not smoke and are not divorced )  
The odds of divorce for smokers are

0.49 smoke  
0.31  
0.48

Select one:

- a. 4 times the odds for non-smokers
- b. the same as for non-smokers
- c. about double the odds for nonsmokers
- d. half the odds for non-smokers



