

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) Which of the following events are mutually exclusive? 1) \_\_\_\_\_
- A) being a steelworker and being a stamp collector
  - B) being a college student and being a high school graduate
  - C) living in Baltimore and working in Washington, D.C.
  - D) being a mother and being an uncle
  - E) none of the above

- 2) Two events  $A$  and  $B$  are mutually exclusive if 2) \_\_\_\_\_
- A)  $A \cap B = \emptyset$ .
  - B)  $A \cap B = U$ .
  - C)  $A \cup B = U$ .
  - D)  $A \cup B = \emptyset$ .
  - E) none of the above

A light bulb manufacturer tests a light bulb by letting it burn until it burns out. The experiment consists of observing how long (in hours) the light bulb burns. Let  $E$  be the event "the bulb lasts less than 100 hours,"  $F$  be the event "the bulb lasts less than 50 hours," and  $G$  be the event "the bulb lasts more than 120 hours."

- 3) The event  $E \cup F$  is 3) \_\_\_\_\_
- A) "the bulb lasts less than 100 hours".
  - B) "the bulb lasts between 50 and 100 hours".
  - C) "the bulb lasts more than 50 hours"
  - D) "the bulb lasts less than 50 hours".
  - E) none of the above

- 4) The event  $F' \cap G'$  is 4) \_\_\_\_\_
- A) all possible times.
  - B) "the bulb lasts between 120 hours or less".
  - C) "the bulb lasts 50 hours or more".
  - D) "the bulb lasts between 50 and 120 hours inclusive"
  - E) none of the above

- 5) Which of the following is a valid probability distribution for a sample space  $S = \{a, b, c, d\}$ ? 5) \_\_\_\_\_
- A)  $\Pr(a) = 0.3, \Pr(b) = 0.1, \Pr(c) = 0.2, \Pr(d) = 0.5$
  - B)  $\Pr(a) = -0.2, \Pr(b) = 0.5, \Pr(c) = 0.4, \Pr(d) = 0.3$
  - C)  $\Pr(a) = 0.6, \Pr(b) = 0, \Pr(c) = 0.3, \Pr(d) = 0.1$
  - D)  $\Pr(a) = 0.5, \Pr(b) = 0.2, \Pr(c) = 0.1, \Pr(d) = 0.3$
  - E) none of the above

- 6) Two fair die are rolled. The probability that the numbers that appear add to 4 is 6) \_\_\_\_\_
- A)  $\frac{1}{36}$
  - B)  $\frac{1}{5}$
  - C)  $\frac{1}{6}$
  - D)  $\frac{1}{12}$
  - E) none of the above
- 7) If the odds against an event are 2 to 5, then the probability that the event will occur is 7) \_\_\_\_\_
- A)  $\frac{3}{5}$ .
  - B)  $\frac{2}{5}$ .
  - C)  $\frac{2}{7}$ .
  - D)  $\frac{3}{7}$ .
  - E) none of the above
- 8) A fair coin is tossed six times. The probability of obtaining no heads is 8) \_\_\_\_\_
- A)  $\frac{1}{32}$ .
  - B)  $\frac{0}{64}=0$ .
  - C)  $\frac{1}{64}$ .
  - D)  $\frac{6}{64}=\frac{3}{32}$
  - E) none of the above
- 9) A fair coin is tossed six times. The probability of obtaining at most five heads is 9) \_\_\_\_\_
- A)  $\frac{1}{64}$
  - B) none of the above.
  - C)  $\frac{63}{64}$
  - D)  $\frac{59}{64}$
  - E)  $\frac{5}{64}$

A basket contains five red balls, four white balls and three blue balls. Two balls are drawn, one after the other, with the first ball replaced before the second is drawn. Find the probability of drawing

10) two white balls.

10) \_\_\_\_\_

A)  $\frac{2}{12} = \frac{1}{6}$ .

B)  $\frac{2}{9}$ .

C)  $\frac{4}{12} = \frac{1}{3}$ .

D)  $\frac{1}{9}$ .

E) none of the above

A student is studying mathematics and chemistry. The probability that he passes mathematics is 0.75, the probability that he fails chemistry is 0.2, and the probability that he passes mathematics but fails chemistry is 0.05.

11) The probability that he passes both courses is

11) \_\_\_\_\_

A) 0.

B) 0.75.

C) 0.60.

D) 0.70.

E) none of the above

12) The probability that he either passes mathematics or fails chemistry is

12) \_\_\_\_\_

A) 0.15.

B) 0.90.

C) 1.0.

D) 0.95.

E) none of the above

13) If  $E$  and  $F$  are independent and  $\Pr(E) = 0.3$  and  $\Pr(F) = 0.6$ , then  $\Pr(E \cup F)$  is

13) \_\_\_\_\_

A) 0.18.

B) 0.72.

C) 0.90.

D) 0.

E) none of the above

14) Suppose that  $\Pr(E) = 0.85$ ,  $\Pr(F) = 0.4$ , and  $\Pr(E \cap F) = 0.3$ . Then  $\Pr(F|E) =$

14) \_\_\_\_\_

A)  $\frac{3}{10}$ .

B)  $\frac{3}{4}$ .

C)  $\frac{6}{17}$ .

D)  $\frac{6}{11}$ .

E) none of the above

- 15) Two cards are drawn (without replacement) from an ordinary deck of 52 cards. The probability that the second card is black if the first card is the ace of hearts is 15) \_\_\_\_\_
- A)  $\frac{2}{51}$ .
  - B)  $\frac{26}{51}$ .
  - C)  $\frac{1}{104}$ .
  - D)  $\frac{1}{2}$ .
  - E) none of the above

The probability that person A will pass Finite Mathematics is  $\frac{5}{8}$  and the probability that person B will pass is  $\frac{6}{7}$ .

Assume the events are independent.

- 16) In the situation above, the probability that neither will pass is 16) \_\_\_\_\_
- A) 1.
  - B)  $\frac{3}{56}$ .
  - C)  $\frac{29}{56}$ .
  - D)  $\frac{53}{56}$ .
  - E) none of the above

- 17) In the situation above, the probability that both will pass is 17) \_\_\_\_\_
- A)  $\frac{53}{56}$ .
  - B) 0.
  - C)  $\frac{15}{28}$ .
  - D)  $\frac{30}{54}$ .
  - E) none of the above

- 18) In the situation above, the probability that at least one will pass is 18) \_\_\_\_\_
- A)  $\frac{53}{56}$ .
  - B) 0.
  - C)  $\frac{13}{28}$ .
  - D)  $\frac{30}{56}$ .
  - E) none of the above

The table below gives crime statistics relating to the location of the crime and the type of crime.

	Robbery	Murder	Assault
Residential	130	40	30
Commercial	102	28	20

- 19) Based on the table above, the probability that a randomly-selected crime committed in a residential area is a murder is 19) \_\_\_\_\_
- A)  $\frac{10}{17}$ .
- B)  $\frac{1}{5}$ .
- C)  $\frac{4}{35}$ .
- D)  $\frac{34}{175}$ .
- E) none of the above
- 20) Based on the table above, the probability that a randomly-selected crime was committed in a commercial area given that it was an assault is 20) \_\_\_\_\_
- A)  $\frac{1}{3}$ .
- B)  $\frac{1}{7}$ .
- C)  $\frac{2}{15}$ .
- D)  $\frac{2}{5}$ .
- E) none of the above
- 21) Of the 1000 freshmen enrolled at a certain college, 100 have verbal SAT scores above 650. Thirty of these 100 students earned an A in freshman composition. The probability that a freshman has a verbal SAT score above 650 and earned an A in freshman composition is 21) \_\_\_\_\_
- A)  $\frac{1}{10}$ .
- B)  $\frac{3}{100}$ .
- C)  $\frac{13}{100}$ .
- D) impossible to determine.
- E) none of the above