1. A box with 7 good parts and 2 defective parts. Parts are selected until one defective is found. Find the probability that the defective part is found on the third draw.

[A] 7/15   [B] 1/6   [C] 28/45
[D] 7/45   [E] None of the above

2. A box contains 4 red and 2 blue balls. A ball is selected at random and its color is noted. If it is red it is replaced; otherwise it is not. A second ball is selected and its color is noted. If the second is blue, find the probability that first is blue?

[A] 4/5   [B] 1/5   [C] 10/13
[D] 3/13   [E] None of the above

3. A fair coin is flipped 5 times, what is the probability of getting at least 1 tail?

[A] $1 - \dfrac{1}{2^5}$ [B] $1 - C(5,0)\left(\dfrac{1}{2}\right)^0$ [C] $1 - C(5,1)\left(\dfrac{1}{2}\right)^1\left(\dfrac{1}{2}\right)^4$

[D] $1 - \dfrac{1}{2^4}$ [E]None of the above

4. A polygraph machine correctly identifies a lie 75% of the time, and incorrectly identifies a true statement as a lie 5% of the time. If a person being examined with the machine lies 10% of the time, what is the probability that a statement identified by the polygraph as a true is actually true?

[A] 0.375   [B] 0.972   [C] 0.028
[D] 0.625   [E] 0.875

5. A medical firm has new test to detect hepatitis. It was found that if a person has hepatitis the test will detect it (show positive result) in 96% of cases; it was also found that it will show false positive results in 3% of the cases. Later medical records show that 8% of the people tested did actually have hepatitis. What is the probability that a person who tests positive actually has hepatitis?

[A] 0.7356   [B] 0.9208   [C] 0.8961
[D] 0.1039   [E] None of the above

6. A box contains 7 red and 5 blue balls. A ball is selected at random and its color is noted. If it is blue then it is replaced; otherwise it is not. A second ball is selected and its color is noted. Find the probability that the first ball is blue given that the second is not blue.

[A] 0.567   [B] 0.4545   [C] 0.433
[D] 0.5454   [E] None of the above

7. There are 6 people in a room: 4 Republican males, 1 Democrat female and 1 Democrat male. Two people are selected one after the other without replacement. Find the probability that the first was male given the second was Republican

[A] 0.2   [B] 0.8   [C] 0.6
[D] 0.4   [E] None of the above

8. Two boxes (A) and (B). Box (A) contains 4 red balls and 5 white balls, box (B) contains 2 red balls and 3 white balls. An experiment consists of drawing a ball from box (A) and placing it in box (B) and then drawing a ball from box (B). Draw the tree and find the probability that at least one is white .
[A] 0.622   [B] 0.3778   [C] 0.4074
[D] 0.7777   [E] None of the above

9. Computer parts are manufactured with 20% defective . If 8 parts are selected off continuous assembly line. Find the probability that no more than 6 are good *(at most 6 are good)*.
[A] 0.4967   [B] 0.5033   [C] 0.7969
[D] 0.2031   [E] None of the above

10. A multiple-choice test contains 10 questions with 5 choices for each answer. If a student guesses all the answers, find the probability that he will get at least 1 correct answers.
[A] 0.1074   [B] 0.6242   [C] 0.3758
[D] 0.8926   [E] None of the above

11. A box contains 4 good fuses and 2 defective fuses. If Fuses are drawn one at a time and tested, find the probability that the 2 defective fuses are found after 3 tests.
[A] 1/15   [B] 2/15   [C] 1/5
[D] 2/5   [E] None of the above

12. A box contain 5 red and 5 blue balls. A ball is selected at random and its color is noted. If this ball is red, it is replaced; if it is blue, it is not replaced. Then a second ball is drawn and its color is noted. Find the probability that the second ball is red.
[A] 1/2   [B] 17/36   [C] 19/36
[D] 4/9   [E] None of the above

13. An experiment consists of flipping a fair coin 4 times. The probability of getting at least one head is:
[A] 15/16   [B] 1/16   [C] 3/4
[D] 7/8   [E] None of the above

14. A fair coin is flipped four times, find the probability that there is exactly two heads given that both heads and tails occur.
[A] 1/2   [B] 1/8   [C] 3/7
[D] 3/8   [E] None of the above

15. In a small college, two-third of the students are women and women are twice as likely to take the aerobic class. In one semester, 30% of women took the class. If a randomly selected student took the class, what is the probability that this student is a female?
[A] 0.8   [B] 0.4   [C] 0.2
[D] 0.6   [E] None of the above

16. A NFL kicker knows that he makes one-fourth of his field goal from a long distance. If the outcomes are independent, what is the probability that he will make at least 2 field goals from 5 attempts?
[A] 290/1024   [B] 243/1024   [C] 376/1024
[D] 360/1024   [E] None of the above

17. Each morning Tom decides whether to attend economic class. He attend with probability 0.7, and each decision is independent of what he has done in the past (*Bernoulli process*). Find the probability that he attends at least 6 of 10 classes given that he attends at least one but not all of the 10 classes.
[A] 0.8654   [B] 0.8454   [C] 0.8744
[D] 0.8545   [E] None of the above

18. In a lab, there are 8 mice: 1 gray male, 4 white females, and 3 white males. Two mice are selected one after the other without replacement and their color and sex are noted, find the probability that the first is was a female given the second was a male
[A] 4/7   [B] 2/7   [C] 3/7
[D] 5/7   [E] None of the above

19. At a state university, 60% are undergraduates, 35% graduates and 5% are in special program. Also, 20% of the undergraduates, 40% of the graduates and 70% of the special program are local residents. If a student is selected at random and found to be a resident, find the probability that this student is not a graduate student.
[A] 0.4787   [B] 0.2234   [C] 0.5213
[D] 0.5254   [E] None of the above

20. A true false test has 14 questions. What is the probability of getting at least 13 correct answers?

[A] $\quad 15\left(\dfrac{1}{2}\right)^{14}$ [B] $C(14,13)\left(\dfrac{1}{2}\right)^{14} + C(14,14)\left(\dfrac{1}{2}\right)^{14}$

[C] $C(14,13)\left(\dfrac{1}{2}\right)^{13}\left(\dfrac{1}{2}\right)^{1} + C(14,14)\left(\dfrac{1}{2}\right)^{14}\left(\dfrac{1}{2}\right)^{0}$ [D] $C(14,1)\left(\dfrac{1}{2}\right)^{1}\left(\dfrac{1}{2}\right)^{13} + C(14,0)\left(\dfrac{1}{2}\right)^{0}\left(\dfrac{1}{2}\right)^{14}$

[E] All of the above   [F] None of the above

21. A medical firm has new test to detect diabetes. It was found that the test results in a correct positive 90% of the time, and a correct negative 95% of the time. If 10% of the population has diabetes, what is the probability that a randomly selected person will have a false positive test result?
[A] 0.9302   [B] 0.0654   [C] 0.045
[D] 0.0215   [E] None of the above

22. Statistic shows that 4% of men are colorblind and 0.3% of women are colorblind. Assuming the population is half male and half female. If a person selected at random is colorblind, what is the probability that this person is a woman?
[A] 0.333   [B] 0.667   [C] 0.0698
[D] 0.955   [E] None of the above

23. A basketball player makes one-third of his shots. If the outcomes are independent, what is the least number of shots that he must try such that the probability of at least one good shot is 0.75? *(see # 19 in section 4.4)*
[A] 2   [B] 3   [C] 4
[D] 5   [E] None of the above

24. A fair die is rolled 10 times. What is the probability of getting a number larger than 2 on at most 8 of the ten rolls? *(see # 7 in section 4.4)*
[A] 0.1040   [B] 0.9996   [C] 0.7884
[D] 0.8959   [E] None of the above