1. A bag contains 7 black and 4 white balls two balls are drawn at a time from the bag. The probability at least one white ball is selected:

A. $\frac{7}{11}$
B. $\frac{5}{11}$
C. $\frac{28}{55}$
D. $\frac{34}{55}$

2. A coin is tossed 7 times. Then the probability that at least 4 consecutive heads appear is:

A. 3/16
B. 5/32
C. 5/16
D. 1/8

3. A man throws a die until he gets a number bigger than 3. The probability that he gets 5 in the last throw

A. $\frac{1}{3}$
B. $\frac{1}{4}$
C. $\frac{1}{6}$
D. $\frac{1}{36}$

4. A natural numbers ‘x’ is chosen at random form the first 1000 natural numbers. If [.] denotes the greatest integer function and the probability that

$$\left[\frac{x}{2}\right]+\left[\frac{x}{3}\right]+\left[\frac{x}{5}\right]=\frac{31x}{30}$$

A. $\frac{31}{1000}$
B. $\frac{33}{999}$
C. $\frac{33}{1000}$
D. $\frac{67}{1000}$

5. There are 10 tickets numbers 0,1 ,2, 3, ….., 9 Two tickets are drawn. If the numbers obtained by writing the digits together is a perfect square, then the probability that sum of digits is 9 is

A. $\frac{1}{3}$
B. $\frac{5}{7}$
C. $\frac{4}{9}$
D. None of these

6.If p and q are chosen randomly from the set {1,2,3,4,5,6,7,8,9,10} with replacement, Then the probability that the roots at the equations $x^2+px+q=0$.

A. are real is $\frac{33}{50}$

B. are imaginary is $\frac{19}{50}$

C. are real and equal is $\frac{3}{100}$

D. are real and distinct is $\frac{59}{100}$

7. Two distinct number a and b are chosen randomly form the set $\left\{2,2^2,2^3,....2^{25}\right\}$. Then the probability that $\log_a b$ is an integer is

A. $\frac{131}{300}$

B. $\frac{31}{300}$

C. $\frac{21}{300}$

D. $\frac{62}{300}$

8. A and B two alliteratively with a pair of dice. A wins if he throws a sum 6 before B throws 7 and B wins if he throws a 7 before A throws sum 6. If A starts the game his chance of winnings is

A. $\frac{30}{61}$

B. $\frac{31}{61}$

C. $\frac{15}{61}$

D. $\frac{60}{61}$

9. If two events A and B such that $P\left(A^c\right)=0.3,\ P\left(B\right)=0.5\ \&\ P\left(A\cap B\right)=0.3,$ then $P\left(B\,|\,A\cup B^c\right)$ is

A. 3/8

B. 2/3

C. 5/6

D. 1/4

10. A and B are event of an experiment such that $0 < P(A), P(B) < 1$. If $P(B^c) > P(A^c)$, Then

A. $P(A \cap B^c) < P(A^c \cap B)$

B. $P(A \cap B^c) = P(A^c \cap B)$

C. $P(B|A) < P(A|B)$

D. $P(B|A) > P(A|B)$

11. A natural number x is chosen from the first 100 natural numbers. The probability that $\frac{x^2 - 60x + 800}{x - 30} < 0$ is:

A. $\frac{3}{25}$

B. $\frac{1}{50}$

C. $\frac{7}{25}$

D. none of these

12. Two person each make a single throw with a pair of dice. The probability that their throws are unequal is:

A. $\frac{1}{6^3}$

B. $\frac{70}{6^3}$

C. $\frac{115}{216}$

D. $\frac{575}{648}$

13. Consider the system of equations $ax + by = 0$ and $cx + dy = 0$ where $a, b, c, d \in \{1, 2\}$. The probability that the system of equations has a unique solution is:

A. 3/8

B. 5/16

C. 9/16

D. 5/8

14. Box I contains 3 white, I blacks, Box II contains 2 white. 2 black and Box III contains I white, 3 black balls. If from each of these boxes one ball is drawn at random, find the probability that 2 white and 1 black ball will be drawn

A. $13/32$

B. 1/4

C. 3/16

D. 1/32

15. Assume that birth of a boy or girl to a couple to be equally likely, mutually exclusive and independent of the other children in the family for a couple having 6 children the probability that their ‘’three oldest are boys’’ is:

A. $\frac{20}{64}$ B. $\frac{1}{64}$

C. $\frac{8}{64}$ D. none

16. If E_1, E_2 are two events such that $P(E_1)=\frac{3}{10}, P(E_2)=\frac{1}{4}$ & $P(E_1 \cap E_2)=\frac{1}{5}$, then $P\left((E_1^C / E_2^C)^C\right)=$

A. $\frac{2}{15}$ B. $\frac{11}{15}$

C. $\frac{13}{15}$ D. $\frac{14}{15}$

17. In a 3×3 matrix the entries a_{ij} are randomly selected from the digits $\{0,1,2,\ldots,9\}$ with replacements.

The probability that the 3-digits number in each row will be divisible by 11 is

A. $\frac{7^3}{10^6}$ B. $\frac{13^3}{10^6}$

C. $\frac{78^3}{10^9}$ D. $\frac{91^3}{10^9}$

18. For independent events $A_1,\ldots.A_n$ $P(A_i)=\frac{1}{i+1}, i=1,2,\ldots.n.$ Then the probability that none of the events will occur is:

A. $n/(n+1)$ B. $n-1(n+1)$

C. $1/(n+1)$ D. $n+1(n+2)$

19. For two events A and B let $P(A)=3/5, P(B)=2/3,$ then which of the following statements is correct?

A. $P(A\cap\bar{B})\le\frac{1}{3}$

B. $P(A\cup B)\ge\frac{2}{3}$

C. $\frac{4}{15}\le P(A\cap B)\le\frac{3}{5}$

D. $\frac{2}{5}\le P(A|B)\le\frac{9}{10}$

20. A number x is chosen at random form the first 100 natural. The probability that it satisfies

A. $x^2-25x\le150$ is 0.3

B. $x^2-17x+30\ge0$ is 0.88

C. $30x-x^2$ is a perfect square of a natural numbers is 0.07

D. $30x-x^2<0$ is 0.7

21. When a fair die is thrown twice let (a, b) denote the outcome in which the first throw shows a and the second shows b. Further, let A, B and C be the following events:

$A=\{(a,b)|\ a\ is\ odd\}$

$B=\{(a,b)|\ b\ is\ \ odd\}\ \ \&\ C=\{(a,b)|\ a+b\ \ is\ \ odd\}$

Then-

A. $P(A\cap B)=1/4$

B. $P(B\cap C)=1/4$

C. $P(A\cap C)=1/4$

D. $P(A\cap B\cap C)=0$

22. Let E, F and G be any three events with $P(E)=0.3,\ P(F|E)=0.2,\ P(G|E)=0.1$ and $P(F\cap G|E)=0.05.$Then $P(E-(F\cup G))$ equals

A. 0.155

B. 0.175

C. 0.225

D. 0.255

23. Let E and F be two events with $0<P(E)<1,\ 0<P(F)<1 \,\&\, P(E)+P(F)\geq 1$.which of the following statements is are TREU?

A. $P(E^c)\leq P(F)$

B. $P(E\cup F)<P(E^c\cup F^c)$

C. $P(E|F^c)\geq P(F^c|E)$

D. $P(E^c|F)\leq P(F|E^c)$

24. Let E and F be two independent events with

$$P(E|F)+P(F|E)=1,\ P(E\cap F)=\frac{2}{9}\ \&\ P(F)<P(E).$$

Then $P(E)$ equals

A. $\frac{1}{3}$

B. $\frac{1}{2}$

C. $\frac{2}{3}$

D. $\frac{3}{4}$

25. A fair die is rolled 3 times. The conditional probability of 6 appearing exactly once given that it appeared at least once equals

A. $\dfrac{3\left(\frac{1}{6}\right)^2\left(\frac{5}{6}\right)}{1-\left(\frac{5}{6}\right)^3}$

B. $\dfrac{\left(\frac{1}{6}\right)\left(\frac{5}{6}\right)^2}{1-\left(\frac{5}{6}\right)^3}$

C. $\dfrac{3\left(\frac{1}{6}\right)\left(\frac{5}{6}\right)^2}{1-\left(\frac{5}{6}\right)^3}$

D. $\dfrac{\left(\frac{1}{6}\right)^2\left(\frac{5}{6}\right)}{1-\left(\frac{5}{6}\right)^3}$

26. Let E, F and G be three events such that the events E and F are mutually exclusive, $P(E\cup F)=1,\ P(E\cap G)=\frac{1}{4}\ \&\ P(G)=\frac{7}{12}$. Then $P(F\cap G)$ equals

A. $\frac{1}{12}$

B. $\frac{1}{4}$

C. $\frac{5}{12}$

D. $\frac{1}{3}$

27. A fair die is rolled times independently. Given that 6 appeared at least once, the conditional probability that 6 appeared exactly twice equals ____________

28. Let E, F and G b three events such that

$$P(E\cap F\cap G)=0.1, P(G\,|\,F)=0.3 \text{ and } P(E\,|\,F\cap G)=P(E\,|\,F).$$

Then $P(G\,|\,E\cap F)$ equals_______

29. For three events A, B and C, P (Exactly one of A or B occurs) =P (Exactly one of B or C occurs) =P(Exactly one of C or A occurs) =41and P (All the three events occur simultaneously)=161. Then the probability that at least one of the events occurs, is.

30. Consider four coins labelled as 1,2,3 and 4. Suppose that the probability of obtaining a 'head' in a single toss of the i^{th} coins is $\frac{i}{4}$, $i=1,2,3,4.$ A coin is chosen uniformly at random and flipped. The Probability that the flip resulted in a 'head' is ___________

31. Let A_1, A_2 & A_3 be three events such that

$$P(A_i)=\frac{1}{3}, i=1,2,3; P(A_i\cap A_j)=\frac{1}{6}, 1\le i\ne j\le 3 \text{ and } P(A_1\cap A_2\cap A_3)=\frac{1}{6}.$$

Then the probability that none of the events A_1, A_2, A_3 occurs equals __________

32. There are four uruses labeled U_1, U_2, U_3 & U_4 each containing 3 blue and 5 real balls. The fifth urn, labelled U_5, contains 4 and 4 red balls. An is selected at random from these five urns a ball is drawn at random at from it. The Probability that selected ball is red is - ___________

33. A and B are two weak students is Mathematics and their chances of solving a problem correctly are $\frac{1}{8}$ and $\frac{1}{12}$ respectively. They are given a problem and they obtain the same answer. If the probability of a common mistake is $\frac{1}{1001}$, then

a. the probability Both obtaining answer are same that the answer was correct is __________

b. the probability that the answer was correct is___________