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**DEPARTMENT: BS (SE)**

**SECTION: A**

**COURSE: PROBABILITY AND STATISTICS**

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**ASSIGNMENT NO: 1**

**Question no: 01**

**A fair six-sided die is rolled twice. What is the probability of getting 2 on the first roll and not getting 4 on the second roll?**

**SOLUTION:**

S = {1,2,3,4,5,6}

P(2) = 1/6

P (not 4) = 5/6

= (1/6) (5/6) = 0.13

= 13%

**Question no: 02**

**A bag contains 8 black pens and 2 red pens and if a pen is drawn at random. What is the probability that it is black pen or red pen?**

**SOLUTION:**

P (BLACK) = 8

P (RED) = 2

P (BLACK or RED) = 8/ 10 + 2 / 10

P (BLACK or RED) = 1

P (BLACK or RED) = 100%

**Question no: 03**

**A coin is thrown 3 times. what is the probability that at least one head is obtained?**

**SOLUTION:**

S = {HHH, TTT, HTT, THT, TTH, THH, HTH, HHT}

P (ATLEAST ONE HEAD) = 7/ 8

P (ATLEAST ONE HEAD) = 0.875

P (ATLEAST ONE HEAD) = 87.5%.

**Question no: 04**

**What is the probability of getting a sum of 7 when two dice are thrown?**

**SOLUTION:**

Sample space of 2 dice = { (1, 1) (1, 2) (1, 3) (1, 4) (1, 5) (1, 6)

(2, 1) (2, 2) (2, 3) (2, 4) (2, 5) (2, 6)

(3, 1) (3, 2) (3, 3) (3, 4) (3, 5) (3, 6)

(4, 1) (4, 2) (4, 3) (4, 4) (4, 5) (4, 6)

(5, 1) (5, 2) (5, 3) (5, 4) (5, 5) (5, 6)

(6, 1) (6, 2) (6, 3) (6, 4) (6, 5) (6, 6) }

So, pairs with sum 7 are (1, 6) (2, 5) (3, 4) (4, 3) (5, 2) (6, 1)

Total outcomes = 36

Favorable outcomes = 6

P ( sum of 7) = 6 / 36 = 1/6

P(sum of 7) = 1/6

P(sum of 7) = 0.16

P(sum of 7) = 16%

**Question no: 05**

**Find the probability of getting two heads when five coins are tossed.**

**SOLUTION:**

Sample space will be:

{HHHHH}, {HHHHT}, {HHHTT}, {HHTTT}, {HTTTT}, {TTTTT}, {TTTTH}, {TTTHH}, {TTHHH}, {THHHH}, {HTHTH}, {THTHT}, {HHTHH}, {TTHTT}, {HTTHT}, {THHTH}, {THHHT}, {HTTTH}, {THHTT}, {HTTHH}, {HHTTH}, {TTHHT}, {TTHTH}, {HHTHT}, {HTHTT}, {THTHH}, {THTTH}, {HTHHT}, {HTHTT}, {THTHH}, {HHHTH}, {TTTHT}.

P(TWO HEADS) = 10/32

P(TWO HEADS) = 0.31

P(TWO HEADS) = 31%

**Question no: 06**

**The graphic above shows a container with 4 blue triangles, 5 green squares and 7 red circles. A single object is drawn at random from the container.**

**Match the following events with the corresponding probabilities:**

**(i) The objects is not a circle**

**(ii) The objects is a triangle**

**(iii) The objects is not a triangle**

**(iv) The objects is not a square**

**(v) The objects is a circle**

**(vi) The objects is a square**

**(a) 5/16**

**(b) 4/16**

**(c) 7/16**

**(d) 9/16**

**(e) 12/16**

**(f) 11/16**

**SOLUTION:**

**(i) The objects is not a circle**

**ANSWER:** 9/16

**(ii) The objects is a triangle**

**ANSWER: 4/16**

**(iii) The objects is not a triangle**

**ANSWER:** 12/16

**(iv) The objects is not a square**

**ANSWER:** 11/16

**(v) The objects is a circle**

**ANSWER:** 7/16

**(vi) The objects is a square**

**ANSWER:** 5/16

**Question no: 07**

**A bag contains 3 red balls and 4 black balls. A ball is drawn at random from the bag. Find the probability that the ball drawn is**

**(i) Black**

**(ii) Not black.**

**No. Red balls =3**

**No. Black balls = 4**

Total number of balls =4 + 3 = 7

P (BLACK) = 4/7

P (BLACK) = 0.57

P (BLACK) = 57%

P ( NOT BLACK) = 3/7

P ( NOT BLACK) = 0.42

P ( NOT BLACK) = 42%

**Question no: 08**

In how many ways can 10 people be lined up for a photograph?

P (10) = 10!

P(10) = 3628800

**Question no: 09**

**How many words can be made from rearrangements of the word ALPACA?**

**SOLUTION:**

A = 3

L = 1

P = 1

C = 1

P = 6! / 3!

P = 120

**Question no: 10**

**In how many ways can a committee of 4 people be chosen out of 8 people?**

**SOLUTION:**

8C4 = 8! / 4!(8 - 4)!

8C4 = 8! / 4! x 4!

8C4 = 70