- 1. Consider a fair coin with two sides having labels h and t respectively. Suppose we perform the experiment where we toss the coin 3 times and note down the outcome on the top face. The sample space S for this experiment is given by
 - (a) $S = \{\emptyset, h, t\}$
 - (b) $S = \{0, 1, 2, 3\}$
 - (c) $S = \{hhh, hht, hth, htt, thh, tht, ttt\}$
 - (d) $S = \{hhh, ttt\}$
- 2. Consider a fair die with the faces labeled as $\{\alpha, \beta, \gamma, \delta, \eta, \theta\}$. Suppose we perform an experiment where we roll the die till η appears on the top face and note down the number of rolls it took. The sample space S for this experiment is given by
 - (a) $S = \{\alpha, \beta, \gamma, \delta, \eta, \theta\}$
 - (b) $S = \{0, 1, 2, 3, 4, 5, 6\}$
 - (c) $S = \{\eta\}$
 - (d) $S = \{1, 2, 3, 4, 5, 6, \dots, \}$
- 3. Consider a fair die with the faces labeled as $\{1, 2, 3, 4, 5, 6\}$. Suppose we perform an experiment where we roll the die till 2 appears on the top face followed by 1 and note down the number of rolls it took. The sample space S for this experiment is given by
 - (a) $S = \{1\}$ (b) $S = \{2, 3, 4, 5, 6, \dots, \}$ (c) $S = \{1, 2, 3, 4, 5, 6, \dots, \}$ (d) $S = \{2\}$
- 4. Consider a fair coin with two sides having labels h and t. Suppose we perform a two step experiment. In the first step we choose a number, N, randomly from $\{1, 2, 3\}$. In the second step we toss the coin N times. We note down the number of times that h appears on the top side in N tosses. The sample space S for this experiment is given by
 - (a) $S = \{1, \ldots, N\}$
 - (b) $S = \{0, 1, 2, 3\}$
 - (c) $S = \{1, 2, 3, 4, 5, 6\}$
 - (d) $S = \{htt, hht, thh, hth, hhh\}$
- 5. Consider a bag with 10 blue balls and 20 green balls. We choose a ball at random from the bag and note down its colour. The sample space S for this experiment is given by
 - (a) $S = \{$ blue, green $\}$

(b) $S = \{1, 2, 3, \dots, 20\}$ (c) $S = \{1, 2, 3, \dots, 10\}$ (d) $S = \{1, 2, 3, \dots, 30\}$

- 6. Consider a class of NPTEL students with the following names: Geeta, Ryan, Soha, Batti, Priya, Jaspal, Hafeeza. We choose a student at random and note down the number of vowels in their name. The sample space S for this experiment would be
 - (a) $S = \{a, e, i, o, u\}$
 - (b) $S = \{1, 2, 3, 4\}$
 - (c) $S = \{1, 2, 3, 4, 7\}$
 - (d) $S = \{1, 2, 3, 4, 5, 6, 7\}$
- 7. A kho-kho tournament is played between 4 teams: South NPTEL, North NPTEL, West NPTEL, East NPTEL. The league tournament ends in a 4 way tie. The organisers decide to choose a team at random to determine the winner. The sample space S for this experiment is given by
 - (a) $S = \{1\}$
 - (b) $S = \{1, 2, 3, 4\}$
 - (c) $S = \{$ South NPTEL, North NPTEL, West NPTEL, East NPTEL $\}$
- 8. Please indicate the correct answer after evaluating the following expressions in R:
 - (a) > 2+5i. 7 ii. [1] 7 iii. [1] 2+5(b) > 3-7i. 3 ii. [1] 3-7 iii. [1] -4 (c) > 4*5i. [1] 20 ii. 4 iii. [1] 4*5 (d) > 6/5i. [1] Inf ii. 1.2 iii. [1] 1.2 $(e) > 2^{5}$ i. [1] 32 ii. 2

iii. [1] 25

- 9. Using the help() command first understand that the inbuilt R-function choose(n,k) returns the binomial coefficient ${}^{n}C_{k}$. Please indicate the correct answer after evaluating the following expressions in R:
- 10. Using the help() command first understand that the inbuilt R-function fractions(d) converts a decimal into a fraction in the simplest form and decide what does library(MASS) do. Please indicate the correct answer after evaluating the following expressions in R:
 - (a) > library(MASS) > fractions(0.375) i. [1] 3/8 ii. 375 iii. [1] 38 (b) > library(MASS) > fractions(0.578125) i. [1] 57/100000 ii. 200 iii. [1] 37/64