For numerical answers with decimal digits please read instructions.

1. A pair of fair distinguishable dice are thrown. Let X represent the maximum of the two values on the dice and let Y represent the minimum of the two values.
   (a) S is the domain of functions X and Y.Then number of elements in S is _____.
   (b) Ranges of X and Y are respectively:
      i. {2,3,4,5,6} and {1,2,3,4,5}
      ii. {1,2,3,4,5,6} and {1,2,3,4,5,6}
      iii. {2,3,4,5,6} and {1,2,3,4,5,6}
      iv. None of the above
   (c) $\mathbb{P}$(X=5) is equal to $\frac{(i)}{(ii)}$.
   The above fraction should be in the simplest form, i.e. g.c.d $\{ (i), (ii) \}$ *=1.*
   (d) $\mathbb{P}$(Y=3) is equal to $\frac{(i)}{(ii)}$.
   The above fraction should be in the simplest form, i.e. g.c.d $\{ (i), (ii) \}$ *=1.*
2. A class of ten students is comprised of seven women and three men. Four students are randomly selected from the class. Let Z denote the number of men among the four randomly selected students. Then $\mathbb{P}(Z = 2)$ is equal to $\frac{(i)}{(ii)}$.
   The above fraction should be in the simplest form, i.e. g.c.d $\{ (i), (ii) \}$ *=1.*
3. Of the people who enter a blood bank to donate blood, 1 in 3 have type O^+ blood and 1 in 15 have type O^- blood. For the next three people entering the blood bank, let X denote the number with type O^+ blood and Y the number with type O^- blood.
   (a) Distribution of X is best approximated by:
      i. $\mathbb{P}(X = 0) = .2963, \mathbb{P}(X = 1) = 0.4444, \mathbb{P}(X = 2) = 0.2222, \mathbb{P}(X = 3) = 0.037$
      ii. $\mathbb{P}(X = 0) = .29, \mathbb{P}(X = 1) = 0.4444, \mathbb{P}(X = 2) = 0.227, \mathbb{P}(X = 3) = 0.0385$
   (b) Distribution of Y is best approximated by:
      i. $\mathbb{P}(Y = 0) = 0.839, \mathbb{P}(Y = 1) = 0.1342, \mathbb{P}(Y = 2) = 0.0101, \mathbb{P}(Y = 3) = 0.0166$
      ii. $\mathbb{P}(Y = 0) = 0.813, \mathbb{P}(Y = 1) = 0.1742, \mathbb{P}(Y = 2) = 0.0124, \mathbb{P}(Y = 3) = 0.0003$
4. Using the `help()` command understand that the inbuilt R-function `ppois(q,lambda)` returns the probability of a Poisson random variable with mean `lambda` having a value lesser than or equal to `q`. Choose the correct answer after evaluating the following expressions in `R`.

(a) `> ppois(4,5)`

i. [1] 0.4139
ii. [1] 0.4723
iii. [1] 0.4404

(b) `> ppois(10,5)`

i. [1] 0.9927
ii. [1] 0.9863
iii. [1] 0.9726

5. Using the `help()` command understand that the inbuilt R-function `dpois(x,lambda)` returns the probability of a Poisson random variable with mean `lambda` having a value equal to `x`. Choose the correct answer after evaluating the following expressions in `R`.

(a) `> dpois(4,5)`

i. [1] 0.1754
ii. [1] 0.1827
iii. [1] 0.1946

(b) `> dpois(10,5)`

i. [1] 0.0181
ii. [1] 0.0273
iii. [1] 0.0289

6. Using the `help()` command understand that the inbuilt R-function `qpois(p,lambda)` returns the smallest value `x` such that the probability of a Poisson random variable with mean `lambda` having a value lesser than or equal to `x` is at least `p`. Choose the correct answer after evaluating the following expressions in `R`.

(a) `> qpois(0.5,5)`

i. [1] 4
ii. [1] 5
iii. [1] 6

(b) `> qpois(0.99,5)`

i. [1] 10
ii. [1] 11
iii. [1] 12