IIITS

DMPT (Probability Theory)

Assignment

1. Find the number of integers between 1 and 250 that are divisible by any of the integers 2,3 and 7.
2. Suppose that a password for a computer system must have at least 8 but not more than 12 characters where each character in the password is a lowercase english letter, an uppercase english letter, a digit or one of the 6 special characters *,>,<,!,+ and=
   i) How many different passwords are available for this computer system
   ii) How many of these passwords contain at least one occurrence of at least one of the six special characters.
3. Suppose that a popular style of running shoes is available for both men and women.The women shoes come in sizes 6,7,8,9 and men shoes comes in sizes 8,9,10,11 and 12.The women shoes come in white, red and black color and men shoe comes in white and black color.
   i) Use tree diagrams to determine the number of different shoes that a store has to stock to have at least one pair of this type of running shoes for all available sizes and colors for both men and women.
   ii) Use some counting rule to determine the above problem.
4. A drawer contains a dozen brown socks and a dozen black socks, all unmatched.A man takes socks out at random in the dark.
   i) How many socks must he take out to be sure that he has at least two socks of the same color.
   ii) How many socks must he take out to be sure that he has at least two black socks.
5. If 30 dictionaries in a library contain a total of 61327 pages,then at least how many pages one dictionary should have?
6. How many ways are there to distribute 5 balls into 3 boxes if each box must have at least one ball in it if
   i) Both balls and boxes are labeled
   ii) The balls are labeled, but boxes are unlabeled
   iii) Balls are unlabeled, but boxes are labeled
   iv) Both balls and boxes are unlabeled
7. How many ways are there to choose 8 coins from a piggy bank containing 100 identical pennies and 80 identical nickels.
8. How many different combinations of pennies,nickels,dimes,quarters,half dollar can a piggy bank contain if it has 20 coins in it.
9. How many ways are there to deal hands of five cards to each of 6 players from a deck containing 48 different cards.

10. How many ways are there to place 10 indistinguishable balls into 8 distinguishable bins.
11. Use Venn diagrams and solve
    i) In a group of 25 people, 18 people have own house, 13 people have own car and 2 people have neither own house nor own car. How many people have both?
    ii) In a group of students 60% have passed step 1 exam ,45% have passed step 2 exam and 25% have passed both. what percentage of students have passed neither?

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