

Homework - 5 Counting

1. (1 point) John wants to make a list of passwords he can use in the future, with each password containing a sequence of 4 lowercase English alphabets followed by 2 digits. How many different passwords can John create?

- a. 124
- b. 4,569,760
- *c. 45,697,600
- d. 94

2. (1 point) A manager has to choose 1 employee of the month from a list of exceptional employee names he received from 3 departments. Department A's list has 5 names, Department B's list has 7 names and Department C's list has 3 names. No name is on more than one list. How many names are there to choose from?

- *a. 15
- b. 105
- c. 10
- d. 95

3. (1 point) A customer can choose one of 3 monitors, one of 2 keyboards, one of 3 CPUs and one of 4 printers, to buy a computer system. Determine the number of possible systems that the customer can choose from.

- a. 70
- b. 12
- c. 10
- *d. 72

4. (1 point) If Susan has red, blue, yellow and green socks and if she decides to blindly pull out a few socks, how many socks must she pull out to guarantee that she has a pair? (Hint: The Pigeonhole Principle)

- a. 4
- *b. 5
- c. 3
- d. Cannot be determined

5. (1 point) A boy lives at X and wants to go to School at Z. From his home X he has to first reach Y and then Y to Z. He may go X to Y by either 3 bus routes or 2 train routes. From there, he can either choose 4 bus routes or 5 train routes to reach Z. How many ways are there to go from X to Z?

- a. 35
- *b. 45
- c. 25
- d. 30

6. (1 point) There are 6 men and 5 women in a room. In how many ways we can choose 3 men and 2 women from the room?

- a. 100
- *b. 200
- c. 300
- d. 250

7. (1 point)

How many possible paths can this algorithm follow given an input array with three values n_1 , n_2 and n_3 ?

```
if (n1 == n2) then
    if (n1 == n3) then
        return [1, 2, 3]
    else
        return [1, 2]
else
    if (n1 == n3) then
        return [1, 3]
    else
        if (n2 == n3):
            return [2, 3]
        else:
            Return n1
```

- a. 1
- b. 4
- *c. 5
- d. 6

8. In how many different ways can the letters of the word 'LEADING' be arranged in such a way that the vowels always come together?

- a. 360
- b. 480

* c. 720

d. 5040

e. None of the above

9. (1 point) What will be the coefficient of x^7 in $(2x - 5y)^7$?

a. 256

*b. 128

c. 64

d. 512

10. (1 point) Mark has 7 pants and 5 shirts. He wants to wear a different combination without buying new clothes. How many weeks can he do this?

a. 4

*b. 5

c. 6

d. 7

11. (1 point) Eight different airlines fly from San Jose to Dallas and five different airlines fly from Dallas to New York. How many different pairs of airlines can you choose on which to book a trip from San Jose to New York via Dallas, when you pick an airline from San Jose for the flight to Dallas and an airline for the continuation flight to New York?

*a. 40

b. 13

c. 8

d. 5

12. (1 point) How many different 6 letter words are possible with keeping first and third letter as 'J' ?

a. 26^6

b. $26 \cdot 25 \cdot 24 \cdot 23 \cdot 22 \cdot 21$

*c. 26^4

d. 26^3

13. (1 point) How many bit strings of length 10 contain at least two 1s and at least four 0s?

*a. 837

b. 912

c. 627

d. 692