



BAHRIA UNIVERSITY (KARACHI CAMPUS)

Discrete Structures (CSC-115)

Assignment 04

Spring 2023

Class: BSE 2B

Course Instructor: ENGR. FAIZ UL HAQUE ZEYA

Assignment Date: 09 June 2023

Student Name: ABDULLAH

Shift: Morning

Due Date: 15 June 2023

Marks: 05 Points

Registration #: 81962

Question 01: Among 40 patients admitted to a hospital, 20 are diagnosed with pneumonia, 15 with bronchitis, and 10 with both pneumonia and bronchitis.

Determine:

- 1) The number of patients diagnosed with pneumonia or bronchitis (or both).
- 2) The number of patients not diagnosed with pneumonia or bronchitis. **(2 marks).**

Answer:

Data:

$$n(N) = 20$$

$$n(B) = 15$$

$$n(N \text{ and } B) = 10$$

Solution:

Using addition rule

$$n(N \text{ or } B) = n(N \cup B)$$

$$= n(N) + n(B) - n(N \text{ and } B)$$

$$= 20 + 15 - 10$$

$$= 25$$

Question 02: How many password combinations are possible with upper- and lower-case alphabets and digit with one digit should be present. The length of password can be from 6 to 8 characters. **(1 mark).**

Answer:

Data:

Total upper letters = 26

Total lower letters = 26

Total digits = 10

Solution:

There are 62 possibilities for each character (26 uppercase letters + 26 lowercase letters + 10 digits).

The number of combinations for a 6-character password is 3×62^5 .

The number of combinations for a 7-character password is 4×62^6 .

The number of combinations for an 8-character password is 5×62^7 .

Total combinations:

$$= (6\text{-digit passwords}) + (7\text{-digit passwords}) + (8\text{-digit passwords}) \\ = (3 * 62^5) + (4 * 62^6) + (5 * 62^7)$$

Question 03: There are 6 people who want to use an elevator. But there is space for only 4 people. How many ways can 6 people try to fill this elevator (one at a time)? (1 mark).

Answer:

Data:

Total persons = 6

Total persons at elevator = 4

Solution:

It is a case of combination where order doesn't matter.

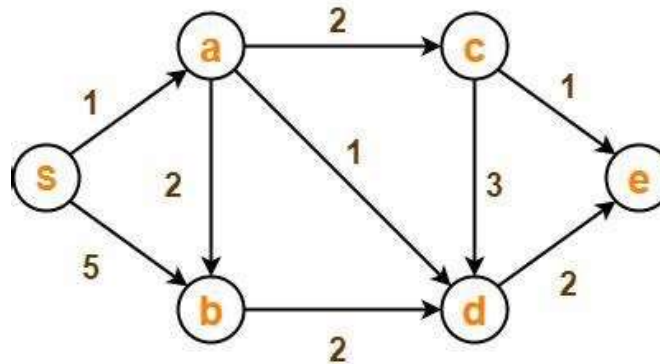
Total ways = 6C_4

$$C(6, 4) = 6! / (4! * (6-4)!)$$

$$= 6! / (4! * 2!)$$

$$= (6 * 5) / (2 * 1) = 15$$

Question 04: Find shortest distance only from node S to all nodes using Dijkstra's Algorithm. (1 mark).



Solution: