

ASSIGNMENT# 1

**COMSATS UNIVERSITY ISLAMABAD SAHIWAL CAMPUS**

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FA23-BCS-251

SECTION: E

SUBMITTED TO

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Discrete Structures

Assignment 1 Discrete Structures Fall-23

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**Question 1:**

Identify the set properties and perform operations to find the solution to problems.

I )

A juice shop which has a capacity of 240 glasses numbered 1 to 240, all even numbered glasses belong to Orange, those whose numbers are divisible by 5 belong to Apple and those whose numbers are divisible by 7 belong to Strawberrry. How many belong to none of the three flavors?

Hint: n( Orange U Apple U Strawberry ) = 202 (shows number of glasses with at least one flavor) Show the steps in set operations to reach solution.

1. 38
2. **82 (correct)**
3. 42
4. 57
5. 26

**Solution:**

Glasses belong to orange=A= {2,3,5,……….240} 240/2=120

n(A)= 120

Glasses belong to apple=B= {5,10,15,………240} 240/5=48

n(B)=48

Glasses belong to strawberry=C= {7,14,21,……….238} 240/7=34

n(C)=34

**NOW,**

AՈB={10,20,30,……240} 240/10=24

n(AՈB)=24

AՈC={14,28,42……….238} 240/14=17.14

n(AՈC)=17

BՈC={35,70,105………240} 240/35=6

n(BՈC)=6

AՈBՈC={70,140,210}

n(AՈBՈC)=3

Total number of Glasses= N =240

None of three= N-n(A)-n(B)-n(C)+n(AՈB)+n(AՈC)+n(BՈC)-n(AՈBՈC)

= 240-12-48-34+24+17+6-3

**None of three= 82**

**II)**

In a city, 40% of the inhabitants purchased Blankets and 70% Quilts for winter season. If 15% of the inhabitants purchased both Blankets and Economics, what % of the inhabitants of the city did not purchase either of the two objects?

1. **5% (correct)**
2. 15%
3. 0%
4. 25%
5. None of these

**Solution:**

Using Formula : n(A or B) = n(A) + n(B) - n(A and B)

Let's assume that there are 100 people in the city. Then:

n(A) = 40 (40% of 100)

n(B) = 70 (70% of 100)

n(A and B) = 15 (15% of 100)\

By using formula, we get

n(A or B) = n(A) + n(B) - n(A and B)

= 40 + 70 - 15

= 95

So, 95 people in the city purchased either blankets or quilts. Now,

**Percentage of people who did not purchase either object = (100 – 95)%**

**= 5%**