QUIZES BY SIR TANVEER

FOR THE SESSION SP26

QUIZ 1

Apply symbolic propositional and predicate logic to determine the most effective solutions of a given problem.

Question 1

Consider the following two compound statements:

S1: “If you come to the club and you cannot enter free, then you did not pay your membership dues.”

S2: “If you pay your membership dues, then if you come to the club, you can enter free.”

Determine whether S1 and S2 are logically equivalent. Justify your answer using logical laws or truth tables.

Question 2

Write the contrapositive of the following (both in English and symbolic form):

“All mathematicians wear glasses.”

Question 3

Let:

: x likes y

: x trusts y

Domain: people

i) Translate the following into First-Order Logic (FOL) and then determine its truth value:

“If there is someone who likes nobody, then everyone trusts at least one person.”

ii)Write the negation of statements that you obtain in part is,so that negations appear only with in predicates.

iii)Translate FOL that you obtain in part ii in English

QUIZ 2

Quiz 2

Question 1

Regarding Modes ponens or Modes Ponens

Question 2

Identify the specific rule of inference being applied. Justify your choice by explaining how the rule is used to derive the conclusion from the given premises;

If I go swimming, then I will stay in the sun too long. If I stay in the sun too long, then I will sunburn. Therefore, if I go swimming, then I will sunburn.

Question 3

(a)prove $3x^2+2y^2=30$

(b) If a and b are integers and $2a= b^2 +3$.

Prove that a is the sum of three squares

QUIZ 3

Question 1

Let

$$f(x) = \begin{cases} 2x+1 & \text{if } x \leq 2 \\ x^2 & \text{if } x > 2 \end{cases}$$
$$g(x) = \begin{cases} -x & \text{if } x < 2 \\ 5 & \text{if } x \geq 2 \end{cases}$$

1. Find $g \circ f$.
2. Find its inverse.

Question 2

Let $S = \{a, b, c\}$.
Let $P(S)$ be the power set of S.
Define a relation R on $P(S)$ as follows:

$$(a, b) \in R \text{ if and only if } a \subseteq b$$

draw matrix of power set and graph for relation R

	$\emptyset$	$\{a\}$	$\{b\}$	$\{c\}$	$\{a, b\}$	$\{a, c\}$	$\{b, c\}$	$\{a, b, c\}$
$\emptyset$								
$\{a\}$								
$\{b\}$								
$\{c\}$								
$\{a, b\}$								
$\{a, c\}$								
$\{b, c\}$								
$\{a, b, c\}$								

QUIZ 4

Question 1

A data center monitors the total amount of data processed by its servers over several days.

- On Day 1, the server processes 1 GB of data.
- On each following day, the additional data processed is equal to the cube of the day number because the number of connected users increases rapidly.

i. Define a recurrence relation for the total amount of data processed after N days.

ii. Using your recurrence relation, calculate the total amount of data processed after Day 5.

Question 2

How many permutation of the 26 letters of English alphabet do not contain any of the string : fish, bird, rat