Yash Agarwal Assignment - 1 B-15

Q1 $\Pi_{eid}(\sigma_{aname = "Boing"}(Aircraft \bowtie certified))$

Q2 $\Pi_{ename}(\sigma_{aname = "Boing"}(Aircraft \bowtie certified) \bowtie Employees))$

Q3 $R_1 \leftarrow \Pi_{fno}(\sigma_{from = "Bonn" \wedge to = "Madras"}(flight))$

$\Pi_{aname}(Aircraft \bowtie R_1)$

Q4 $R_1 \leftarrow \Pi_{eid}(certified)$

$R_2 \leftarrow \Pi_{eid}(\sigma_{salary > 100000}(R_1 \bowtie employee))$

$R_3 \leftarrow \Pi_{aid}(certified \div R_2)$

$\Pi_{aname}(Aircraft \bowtie R_3)$

Q5 $\Pi_{name}(\sigma_{cruisingrange > 3000}(Aircraft \bowtie certified \bowtie Employee)) - \Pi_{name}(\sigma_{aname = "Boeing"} - (Aircraft \bowtie certified \bowtie Employee))$.

Q2

```
<!Doctype html>
<html>
<head>
    <title> Q2 </title>
</head>
<body>

<form Method = "POST"  action = "home.php" >
 <input type ="checkbox"  name = " food"  value " North Indian">
 < input type = "checkbox"  name = "food"  value " South Indian" >
 < input type = "Checkbox"  name = "food"  value " Italian " >
 < input type = "checkbox"  name = "food"  value "Chinese" >
< input type = "submit" >

<?php
    $c = mysqli_connect ("localhost", "root", " ");
    if( mysqli_connect. errno ($c)){
                    echo " Not open ";
    } $K=0;
    $q = $_POST ["name"];
    for( $i=0 ; $i< count($g) ; $i++){
            $query = " select * from Table 2 where food = $q[i] ";
            while ($r = mysqli_fetch_array ($query)){
                    $co[K++] = $r ["friend_name"];
            }
    }
    for ( $i = 0 ; $i < count ($co) ; $i++ ) {
        $query = " select * from Table 3 where friendname = co [i]";
        while ( $r = mysqli_fetch_array ($query)){
                echo $r["conversation" ] ."<br>";
        }
    }
    mysqli_close ($c);
?>
</body>
</html>
```

Ans 3

Software | sid | Oid

Installed | cid | Sid

Computer | cid | Oid

Supports | Component_id | sid

Memory | Component_id | Mid

Video Card | Component_id | Vid

Sound card | Component_id | Sound Card id

Sold with | Aid | cid

Keyboard | Aid | Kid

Monitor | Aid | Monid

Mouse | Aid | Mousid

Operating System | Oid

Desktop | cid | did

operation | Did | Component id

laptop | Lid | cid | mid

Ans 4

Logical data independence is more difficult to achieve than physical data independence, since application programs are heavily dependent on the logical structure of the data that they access.

Ans 5

a)

1NF

$AB \rightarrow C$
$A \rightarrow B$
$A \rightarrow E$
$B \rightarrow F$
$F \rightarrow G$
$F \rightarrow H$
$D \rightarrow I$
$D \rightarrow J$

2NF ⇒

$AB \rightarrow C$
$F \rightarrow G$
$F \rightarrow H$
$D \rightarrow I$
$D \rightarrow J$

$A \rightarrow D$
$A \rightarrow E$

$B \rightarrow F$

⇒ 3NF

$AB \rightarrow C$

$A \rightarrow D$
$A \rightarrow E$

$B \rightarrow F$

$F \rightarrow G$
$F \rightarrow H$

$D \rightarrow I$
$D \rightarrow J$

Key : AB

b)

~~$P \rightarrow Q$~~
~~$P \rightarrow R$~~
$Q \rightarrow R$ ✓
$P \rightarrow Q$ ✓
~~$PQ \rightarrow R$~~ Redundant

P^+

$Q^+ \Rightarrow \{Q\}$

Minimal cover

$Q \rightarrow R$
$P \rightarrow Q$