Exam - CT230 Database Systems

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CT 230 EXAM

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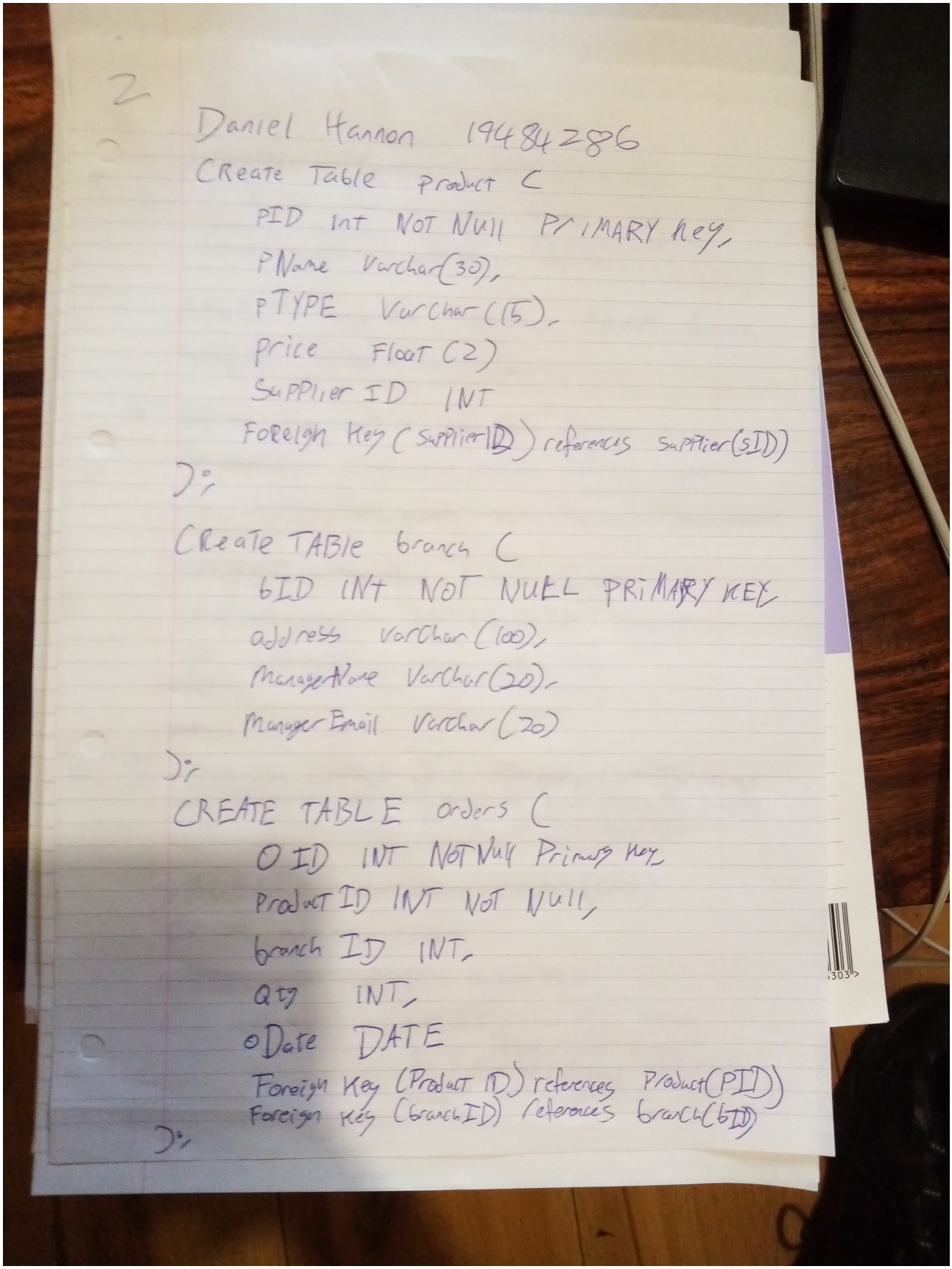
In submitting this work, I confirm that it is entirely my own. I acknowledge that I may be invited to an interview if there is any concern in relation to the integrity of my work, and I am aware that any breach will be subject to the universities procedures for Dealing with breaches of Exam Regulations)

Section A

1 Choosing Suitable Data Types write the SQL code required to create the branch table

```
CREATE TABLE supplier (
    SID INT NOT NULL PRIMARY KEY,
    SName varChar(30),
    address varChar(100),
    website VARCHAR(40),
    discount FLOAT
);
EOF
```



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```
CReate Table product (
    PID INT NOT NULL PRIMARY key,
    PName varchar(30),
    pTYPE VarChar(15),
    price Float(2)
    SupplierID INT
    Foreign Key (supplierID) references supplier(SID))
);

CReate TABle branch (
    bID INT NOT NULL PRIMARY KEY,
    address varChar(100),
    ManageName Varchar(20),
    ManagerEmail Varchar(20)
);
CREATE TABLE orders (
    OID INT NOTNull Primary key,
    ProductID INT NOT Null,
    branch ID INT,
    Qty INT,
    oDate DATE
    Foreign Key (ProductID) references Product(PID))
    Foreign Key (branchID) references branch(bID))
);
```

3

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3 LIST The manager name and email address of The manager of The branch with an address in "Saltkill"

```
SELECT managerName, managerEmail FROM branch
WHERE address = "Saltkill";
```

4 Using The Implict Inner Join Syntax, list The supplier name and address of The Supplier who supplies The product with The name "White Rolls"

```
SELECT supplier.sName, supplier.address
  FROM (supplier INNERJOIN product
  ON supplier.SID = product.supplierID)
WHERE product.pName = "White Rolls";
```

~~5~~

5 Using The explicit Join Syntax, list The names and Quantities of all products ordered by The branches in The location with 'Galway' as their address

```
SELECT product.pName orders.Qty)
FROM product, orders
WHERE orders.productID= product.PID
AND product.PID = (SELECT product.PID FROM
                   supplier INNER JOIN product
                   on supplier.SID = product.supplierID
                   where supplier.address = "Saltkill");
```

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6 Find The Name and address of The supplier who offers The lowest Discount

~~SELECT sName sAddress From Supplier Where discount = (Select Min (Discount) From Supplier)~~

SELECT sName, sAddress From Supplier
Where discount = (Select MIN (Discount) From Supplier)

~~7 Find The Au~~

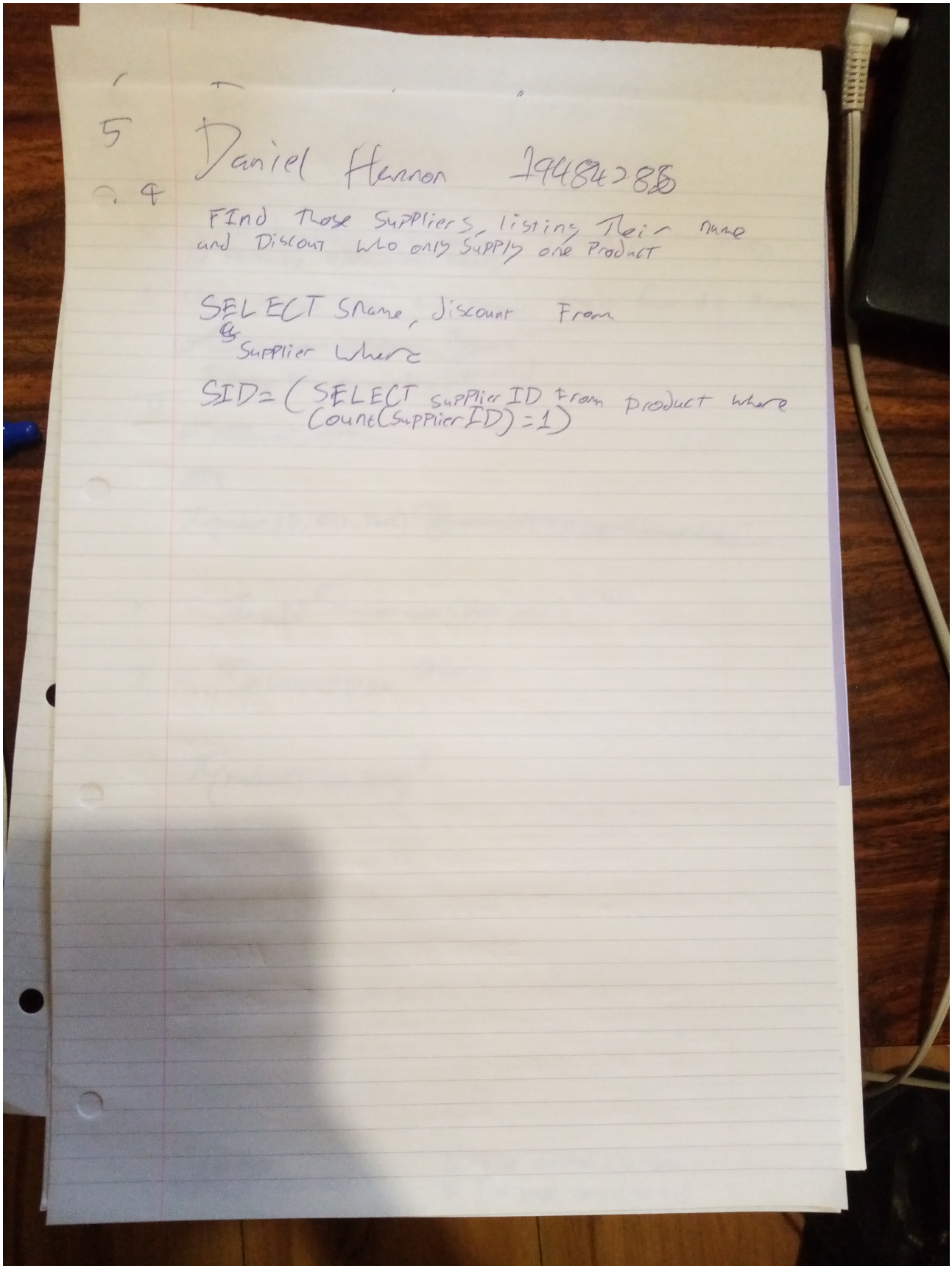
7 Find The number of times The Product with The name 'coffee beans' was ordered by The branch with the address in Barna

SELECT Count(~~*~~ ~~Product ID~~) From orders
Where branch ID = (Select bID from branch
Where address = "Barna")
AND ProductID = (Select pID from Product
Where pName = "coffee beans")

8

8 For all Product types supplied by Suppliers with an address in "Galway" list the product type and number of products of each type

SELECT pType, COUNT(*) as ('Quantity')
FROM Product WHERE
SupplierID = (Select sID From Supplier
Where address = "Galway")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FInd Those Suppliers, listing Their name and Discount who only Supply one Product
SELECT SName, Discount From Supplier Where
SID = (SELECT supplierID from product where Count(SupplierID) = 1)

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2

a Write relational algebra expressions to satisfy the following informational needs

I List manager name and manager email from All Branches

~~σ managerName, ManagerEmail Branch~~

$\pi_{(managerName,\ ManagerEmail)}(branch)$

II

~~σ productID, QTY~~

~~σ~~

$\pi_{(productID,\ QTY,\ Date)}$ ~~σ branchID = π bID σ managerName = "~~

$x = \pi_{bId}\ \sigma_{managerName = 'David\ Konel'}\ branch$

$Y = \sigma_{branchID = x}\ Orders$

$\pi_{(ProductID,\ qty,\ Date)}\ Y$

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B

I

```
SELECT Supplier.SName, Product.PName, Product.Price
FROM Supplier INNER Join Product
ON Product.SupplierID = Supplier.SID
WHERE Product.PType = "Frozen" AND
Product.PID = (SELECT productID FROM
                Orders WheRe
                branchID = 7 AND
                Qty > 50 AND
                oDate > "1-1-2021");
```

II

(I)

1 π Supplier.SName, Product.PName, Product.Price

2 $\bowtie$ Product.SupplierID = Supplier.SID AND

Product.PID 3 π Product.PID

4 σ Orders

5 branchID = 7 AND Qty > 50 And oDate > "1-1-2021"

(II) I procedurally went through the query

1 represents the Select

2 The innerJoin

3 The where clause

4 The nested clause

5 The base conditionals

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III Not Enough Time (Sorry)

Question 3

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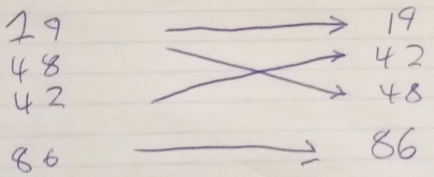
14
48
42
86

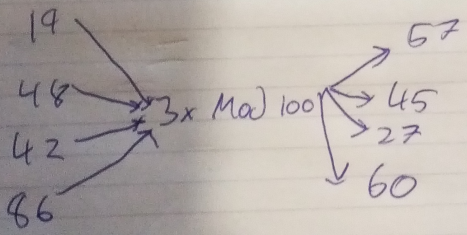
I

Sequential File organisation



II

Hashed file organisation



II Dense indexing is faster as the computer needs to perform less work to access the data/pointers

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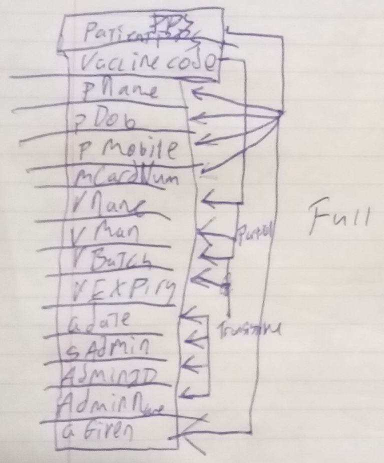
I

PatientPPS | VaccineCode | PName | PDOB | P Mob | MCard | VName

III Cont'd.

VMan | VBatch | V Expiry | aDate s



II