**Princess Sumaya University for Technology**

**King Hussein School for Information Technology Computer Science Department**

**Database Systems Quiz5**

**Student Name: Student ID:**

Choose the correct answer and fill the table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **1** | **2** | **3** | **4** | **5** | **6** |
|  |  |  |  |  |  |

|  |  |
| --- | --- |
| **Product** | **Order** |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **PID** | **PName** | **Price** | **Category** | **Production Date** | **Expired Date** | | 1 | Disk | 900 | Furniture | 1-Nov-11 |  | | 2 | PC | 500 | Office | 3-Oct-12 |  | | 3 | MAC | 800 | Office | 3-Oct-12 |  | | 4 | Tuna | 15 | Food | 9-Jun-16 | 11-Jun-17 | | 5 | Shirt | 25 | Cloth | 2-Sep-16 |  | | 6 | Yogurt | 15 | Food | 6-May-16 | 26-May-16 | | |  |  |  | | --- | --- | --- | | **CID** | **PID** | **Quantity** | | 1 | 2 | 1 | | 2 | 2 | 2 | | 2 | 3 | 5 | | 3 | 3 | 4 | | 4 | 1 | 4 | | 5 | 4 | 1 | | 5 | 3 | 8 | |
| **Customer** | |
| |  |  |  |  | | --- | --- | --- | --- | | **CID** | **CName** | **City** | **Salary** | | 1 | Mostafa | Irbid | 300 | | 2 | Rehab | Amman | 400 | | 3 | Eyad | Zarqa | 200 | | 4 | Ahmed | Irbid | 300 | | 5 | Samer | Maan | 400 | | 6 | Jaser | Amman |  | | |

**Q1: Choose the option that correctly answers the question.**

1. **What is the correct relational Algebra expression that display the names of all products with a price higher than 400?**
2. **πPName (σPID=PID (Product ⨝ Order))**
3. **σPName (πPrice > 400 (Product))**
4. **πPName (σPrice > 400 (Product))**
5. **σPrice > 400 (πPName (Product))**
6. **What is the correct relational Algebra expression that displays all information of customers who live in Irbid?**
7. **σCity=’Irbid’ (Customer)**
8. **σCity=’Irbid’ (Customer ⨝ Order)**
9. **π\* (σCity=’Irbid’ (Customer))**
10. **ℑ\* (σCity=’Irbid’ (Customer))**
11. **What is the correct relational Algebra expression that displays the number of customers and their maximum salary?**
12. **ℑcount(\*), max(Salary) (Customer)**
13. **count(\*)ℑmax(Salary) (Customer)**
14. **πcount(\*), max(Salary) (Customer)**
15. **ℑ(σcount(\*), max(Salary) (Customer))**
16. **What is the correct relational Algebra expression that displays the customer IDs of customers who ordered both products of IDs (1 and 2)?**
17. **πCID (σPID=1(Orders)) ∪ πCID (σPID=2(Order))**
18. **πCID (σPID=1(Orders)) ∩ πCID (σPID=2(Order))**
19. **πCID (σPID=1(Orders)) - πCID (σPID=2(Order))**
20. **πCID (σPID=1(Orders)) X πCID (σPID=2(Order))**
21. **What is the correct relational Algebra expression that displays the ids and names of customers who ordered any Food product?**
22. **πCID, CName (σCategory='Food' (Product) ⨝ Order)**
23. **πCID, CName (σCategory='Food' (Product ⨝ Order))**
24. **σCategory='Food' (Customer ⨝ Order)**
25. **πCID, CName (Customer) − πCID, CName (σCategory='Food' (Product))**
26. **What is the number of attributes that will be retrieved when applying the following expression?**

**Customer ⨝ Order**

1. **3**
2. **4**
3. **6**
4. **7**

**Q2: Write a proper relational Algebra expression to retrieve the requested information:**

1. **Display product names and prices for all Office products.**

π PName, Price (σ Category='Office' (Product))

1. **For each product, display its name and total number of orders requested (عدد الطلبات)**

PNameℑcount(\*)(Product ⨝ Order)

1. **Display the name of the product with the maximum price**

Maxprice = ℑmax(price)(Product)

π PName σ Price=Maxprice(Product)

1. **Display the names of customers and the names of products they have ordered.**

π CName, PName(Product ⨝ (Customer ⨝ Order))