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## Part 1 – Multiple Choice (**20 Points**)

You work for Jeff's Small Engine Shop which uses Oracle 11g as its database as a database administrator.

**Q1.** The database contains a table named Employees. You want to retrieve the first name and address of those employees who earn a salary of USD 1000. The Emp_salary column is of NUMBER(8,2) data type. Which of the following SQL statements will you use to accomplish the task?

1. SELECT Emp_first_name, Emp_add FROM Employees WHERE Emp_salary = 1000;
2. SELECT Emp_first_name, Emp_add FROM Employees;
3. SELECT Emp_first_name, Emp_add FROM Employees WHERE Emp_salary = "1000";
4. SELECT Emp_first_name, Emp_add FROM Employees WHERE Emp_salary = "USD1000";

**Q2.** The database contains a table named Job_recruitment. The table contains columns such as Joining_date, Leaving_date, Tot_salary, and Tot_incentive. The Joining_date and Leaving_date columns are of DATE data type. You perform the following arithmetic operation on these columns:

```
Joining_date - Leaving_date
```

What will the above arithmetic operation return?

1. It will return the result in DATE data type.
2. It will return the result in NUMBER data type.
2. It will return an ORA error.
4. It will return the result in VARCHAR2 type.

**Q3.** The database contains two tables named Employees and Employee_ID. You are required to write a query that will include a subquery. The subquery will be returning multiple rows. Which of the following operators can you use with the subquery? Choose all that apply.

1. IN 2. LIKE 3. NOT IN 4. BETWEEN

**Q4.** Which of the following can be used to populate a table? Choose all that apply.

1. INSERT statement 2. SQL*Loader 3. Data Pump 4. MERGE statement

**Q5.** Which of the following SQL statements will correctly change the value of REGION_ID to 4, for all records, where it is currently set to 2 in **countries** table?

1. UPDATE countries SET region_id='4' WHERE region_id='2';
2. UPDATE countries SET region_id='4';
3. UPDATE countries region_id='4' WHERE region_id=2;
4. UPDATE countries region_id='4' WHERE region_id HAVING 2;

**Q6.** Which of the following is NOT a database object?

1. Sequence 2. View 3. Data file 4.Synonym

**Q7.** Which of the following acts as a function to locate names that sound alike?

1. SOUNDAX 2. SOUNDEX 3. SOUNDEC 4. SAUNDEX

**Q8.** Which of the following is the default format for the resultset of the SYSDATE function?

1. DD-MON-YY 2. MON-DD-YY 3. DD-MON-YYYY 4. MON-DD-YYYY

**Q9.** Which function(s) accept arguments of any datatype?

1. SUBSTR 2. NVL 3. ROUND 4. SIGN

**Q10.** Q: What is the result of MOD(x1, 4), if x1 is 11?

1. -1 2. 3 3. 1 4. 4

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**Q11.** You have issued the CREATE TABLE command to create a table named Employee. You use the following code-line to accomplish the task:

```
CREATE TABLE @EMP (EMP_ID NUMBER, EMP_NAME VARCHAR2 (12), EMP_ADD VARC
HAR    (30), EMP_DEP NUMBER, SALARY NUMBER);
```

The desired table is not created and an error message is returned. Which of the following is the cause of the error message?

1. The statement ends with a semi-colon (;)
2. The table name starts with a special character.
3. The command used to create the table is inappropriate.

**Q12.** The SALARY table has the following data:

| LAST_NAME | FIRST_NAME | SALARY |
|---|---|---|
| Mavris | Susan | 6500 |
| Higgins | Shelley | 12000 |
| Tobias | Sigal | |
| Colmenares | Karen | 2500 |
| Weiss | Matthew | 8000 |
| Mourgos | Kevin | 5800 |
| Rogers | Michael | 2900 |
| Stiles | Stephen | 3200 |

Consider the following SQL, and choose the best option:

```
SELECT last_name, NVL2(salary, salary, 0) N1,
 NVL(salary,0) N2
 FROM salary;
```

1. Column N1 and N2 will have different results.
2. Column N1 will show zero for all rows, and column N2 will show the correct salary values, and zero for Tobias.
3. The SQL will error out because the number of arguments in the NVL2 function is incorrect.
4. Columns N1 and N2 will show the same result.

**Q13**. What is the default length of a column defined as CHAR, if no length is specified?

1. Length is mandatory; you cannot define a CHAR column without length.
2. 256. 3. 1 4. 4,096

**Q14.** What's the error in the following code?

```
SELECT state.st_name, st_code  FROM   state s
WHERE  st_code = 'TX';
```

1. When tables are not joined, a table alias name cannot be used in the query.
2. When a table alias name is defined, it must be used to qualify all the column names.
3. If a table alias name is defined, you cannot use the table name to qualify a column.

**Q15.** Which of the following statements are true about a SELECT statement? Choose all that apply.

1. The SELECT statement can update existing records in a table.
2. The SELECT statement can select multiple columns from a table.
3. The SELECT statement can select all columns from a table.
4. The result is stored in a result table called the result-set.

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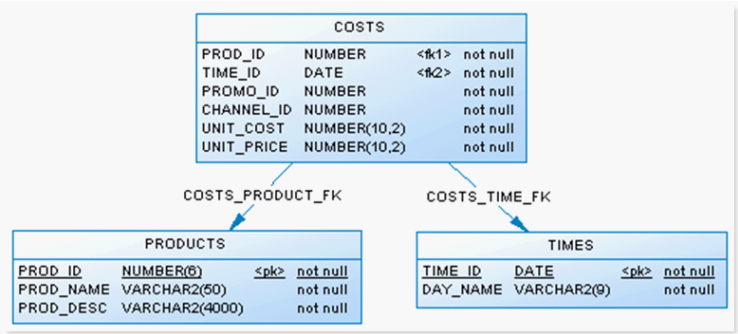
## Part 2 – Write Queries from ERD (**10 Pints**)

Review the following ER Diagram




**Q2.1.** Display the average **unit_cost** (rounded to two decimal places) for a given product on a Saturday and Order the results by the **PROD_NAME** column? Hint use the ROUND function to round the average.

Answer: SELECT a.prod_name, ROUND(AVG(b.unit_cost),2)
FROM products a, costs b, times c
WHERE a.prod_id=b.prod_id AND c.time_id=b.time_id AND c.day_name='Saturday'
GROUP BY a.prod_name ORDER BY a.prod_name;

**Q2.2.** List all product names and their cost sorted by product name.

Answer: Select PRODUCT_NAME, UNIT_COST from PRODUCTS join Costs. (or natural join or join on )

**Q2.3.** List Product Names, DAY_NAME, and Cost for all products

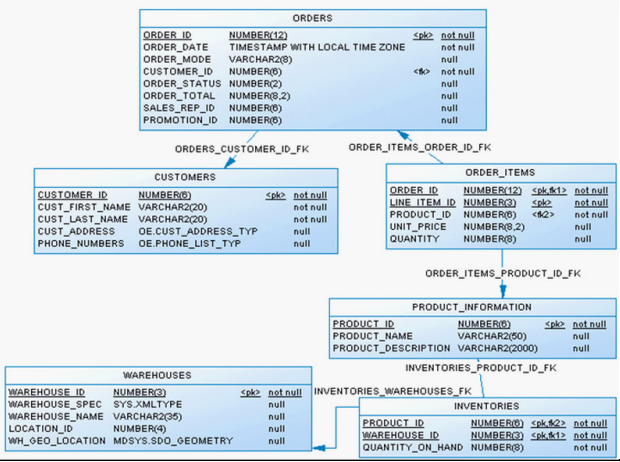
Answer: Select PRODUCT_NAME, UNIT_COST, DAY_NAME from PRODUCTS join Costs join TIMES

**Q2.4.** List product names for all products with names starting with the letters 'A' or 'a' and ending with ''e' or 'E'.

Answer: Select PRODUCT_NAME from PRODUCTS where PRODUCT_NAME like TOUPPER('A%e');

**Q2.5** using this ERD write SQL statements will do the following tasks?

1. Display the following columns:
   cust_first_name and cust_last_name from CUSTOMERS table.
2. order_date, order_mode, order_status, and order_total from ORDERS table
3. Order by the customer_id column in CUSTOMERS
4. Display both customers with and without orders in the ORDERS table




Answer:

```
SELECT a.cust_first_name,
a.cust_last_name, b.order_date,
b.order_mode, b.order_status,
b.order_total
FROM customers a, orders b
WHERE
a.customer_id=b.customer_id
(+)
ORDER BY a.customer_id;
```

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## Part 3– Write Queries (**10 Points**)

Consider the following tables:

1. write SQL statement to list the total sales by CUSTOMER_ID for customers with total individual sales orders greater than $580?

Answer:

```
SELECT b.cust_id, SUM(*)
FROM sales a, customers b
WHERE a.cust_id=b.cust_id
GROUP BY b.cust_id
HAVING SUM(*) > 580;
```

2. List only customers who have sales

3. List all customers and their sales (still list the customers who do not have sales)

Table SALES

| Name | Null? | Type |
|---|---|---|
| PROD_ID | NOT NULL | NUMBER |
| CUST_ID | NOT NULL | NUMBER |
| TIME_ID | NOT NULL | DATE |
| CHANNEL_ID | NOT NULL | NUMBER |
| PROMO_ID | NOT NULL | NUMBER |
| QUANTITY_SOLD | NOT NULL | NUMBER(10,2) |
| AMOUNT_SOLD | NOT NULL | NUMBER(10,2) |

Table CUSTOMERS :

| Name | Null? | Type |
|---|---|---|
| CUST_ID | NOT NULL | NUMBER |
| CUST_FIRST_NAME | NOT NULL | VARCHAR2(20) |
| CUST_LAST_NAME | NOT NULL | VARCHAR2(40) |
| CUST_GENDER | NOT NULL | CHAR(1) |
| CUST_YEAR_OF_BIRTH | NOT NULL | NUMBER(4) |
| CUST_MARITAL_STATUS | | VARCHAR2(20) |
| CUST_STREET_ADDRESS | NOT NULL | VARCHAR2(40) |
| CUST_POSTAL_CODE | NOT NULL | VARCHAR2(10) |
| CUST_CITY | NOT NULL | VARCHAR2(30) |
| CUST_CITY_ID | NOT NULL | NUMBER |
| CUST_STATE_PROVINCE | NOT NULL | VARCHAR2(40) |
| CUST_STATE_PROVINCE_ID | NOT NULL | NUMBER |
| COUNTRY_ID | NOT NULL | NUMBER |
| CUST_MAIN_PHONE_NUMBER | NOT NULL | VARCHAR2(25) |
| CUST_INCOME_LEVEL | | VARCHAR2(30) |
| CUST_CREDIT_LIMIT | | NUMBER |
| CUST_EMAIL | | VARCHAR2(30) |
| CUST_TOTAL | NOT NULL | VARCHAR2(14) |
| CUST_TOTAL_ID | NOT NULL | NUMBER |
| CUST_SRC_ID | | NUMBER |
| CUST_EFF_FROM | | DATE |
| CUST_EFF_TO | | DATE |
| CUST_VALID | | VARCHAR2(1) |

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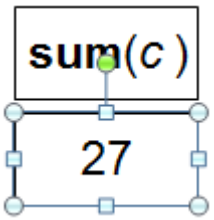
## Part 4– Output (**10 Points**)

<table>
<tr><th>Relation</th><th>Question</th><th>Output</th></tr>
<tr><td rowspan="2">Consider the following EMPLOYEE_EXPENSES table:<br><br><table><tr><th>P_ID</th><th>LastName</th><th>Expenses</th></tr><tr><td>1</td><td>Harry</td><td>1000</td></tr><tr><td>2</td><td>Steve</td><td>400</td></tr><tr><td>3</td><td>Harry</td><td>2000</td></tr></table></td><td>Q4.1. What is the output of the following command:<br><br><pre>SELECT LastName, Expenses
FROM Orders
   GROUP BY LastName</pre></td><td>Answer:<br><table><tr><th>LastName</th><th>Expenses</th></tr><tr><td>Harry</td><td>3000</td></tr><tr><td>Steve</td><td>400</td></tr></table></td></tr>
<tr><td>Q4.2.<br>$\Pi_{\text{Expenses}}(\sigma_{\text{expenses}>900}(\text{EMPLOYEE\_EXPENSES}))$</td><td>Answer:<br><table><tr><th>Expenses</th></tr><tr><td>1000</td></tr><tr><td>2000</td></tr></table></td></tr>
<tr><td rowspan="2">For questions 4.3 thru 4.4 consider the following relation:<br><br><table><tr><th>A</th><th>B</th><th>C</th></tr><tr><td>α</td><td>α</td><td>7</td></tr><tr><td>α</td><td>β</td><td>7</td></tr><tr><td>β</td><td>β</td><td>3</td></tr><tr><td>β</td><td>β</td><td>10</td></tr></table></td><td>4.3. Find<br>$\mathcal{G}_{\text{sum(c)}}(r)$</td><td>  </td></tr>
<tr><td>Q4.4 Find:<br>$_{A}\mathcal{G}_{\text{sum(c)}}(r)$</td><td>Answer:<br><table><tr><th>A</th><th>Sum©</th></tr><tr><td>α</td><td>14</td></tr><tr><td>β</td><td>13</td></tr></table></td></tr>
</table>