Online 1 (Basic SQL)

Section: B
Duration: 50 minutes

Problem 1:

Show all the employees' full name and salary who are not from department 80 and have a salary greater than 6000 or a non-NULL commission percentage in descending order of their commission and then ascending order of their last name.

Solution:

```
SELECT (FIRST_NAME || ' ' || LAST_NAME) FULLNAME, SALARY
FROM EMPLOYEES
WHERE DEPARTMENT_ID <> 80 AND (SALARY > 6000 OR COMMISSION_PCT IS NOT
NULL)
ORDER BY COMMISSION_PCT DESC, LAST_NAME ASC;
```

Problem 2:

The conventional method for creating an email is to combine the initial letter from the First Name field (If it has space then the first character after space too) with the entire Last Name field (without space), both in uppercase, to form the EMAIL field. Nevertheless, some employees might not have their entire last name included in the email. Find employees whose emails don't include their entire last names. Example output:

FIRST_NAME	LAST_NAME	EMAIL
Mozhe	Atkinson	MATKINSO
David	Bernstein	DBERNSTE
...	...	...
Nandita	Sarchand	NSARCHAN
Martha	Sullivan	MSULLIVA

Solution:

```
select first_name, last_name, email
from hr.employees
where upper(email) not like '%'||upper(replace(last_name,' ',''))||'%';
```

Problem 3:

The company is thinking of updating the policy. They have decided to set the minimum salary for any employee to be 8100. How much extra money will they need to spend to accommodate this new policy? Find this amount by writing an sql query in the EMPLOYEES table.

Solution:

```
select sum(8100-salary) as Extra_salary
from hr.employees where salary<8100;
```

Problem 4:

Write a single query to find the total number of employees who are charged with commissions and who are not. The Indicator here is boolean that shows 0 for not being charged and 1 for being charged. Your output should exactly match the following:

IS_COMMISSION_CHARGED?	EMPLOYEE_COUNT
0 (NO)	72
1 (YES)	35

Solution:

```
SELECT
    NVL(TRUNC(COMMISSION_PCT+1.0), 0) ||
    (CASE
       WHEN NVL(TRUNC(COMMISSION_PCT+1.0), 0)=0 THEN ' (NO)'
       ELSE ' (YES)'
    END) AS "IS_COMMISSION_CHARGED?",
    COUNT(EMPLOYEE_ID) AS "EMPLOYEE_COUNT"
FROM HR.EMPLOYEES
GROUP BY
    NVL(TRUNC(COMMISSION_PCT+1.0), 0)
ORDER BY "IS_COMMISSION_CHARGED?";
```

Problem 5:

For each job, print the range of salary (difference between minimum and maximum salary) in that job for the jobs that have more than one employee. Order the result by descending range of salary.
Example output:

JOB_ID	SALARY_RANGE
SA_REP	5400
IT_PROG	4800
...	...
PU_CLERK	600
AD_VP	0

Solution:

```
SELECT JOB_ID, MAX(SALARY) - MIN(SALARY) AS SALARY_RANGE
FROM HR.EMPLOYEES
GROUP BY JOB_ID
HAVING COUNT(*) > 1
ORDER BY SALARY_RANGE DESC;
```

Online 1 (Basic SQL)

Section: C
Duration: 50 minutes

Problem 1:

Show all the employees' employee id, last name and annual salary who are from department 60 or 80 or 100 and have an annual salary greater than 100000 in descending order of their annual salary and then ascending order of their first name.

Solution:

```
SELECT EMPLOYEE_ID, LAST_NAME, SALARY*12 ANNSAL
FROM EMPLOYEES
WHERE DEPARTMENT_ID IN (60, 80, 100) AND SALARY*12 > 100000
ORDER BY ANNSAL DESC, FIRST_NAME ASC;
```

Problem 2:

Create a dept email address for each of the employees in the EMPLOYEES table. Assume that the domain is ".buet.ac.bd". Remember, the company doesn't want to have any space(' ') or underscore('_') in the email address. And everything should be in lowercase. Show the results for employees who have spaces in their first or last name.
Example output:

FIRST_NAME	LAST_NAME	JOB_ID	DEPT_MAIL
Lex	De Haan	AD_VP	lex.dehaan@advp.buet.ac.bd
Jose Manuel	Urman	FI_ACCOUNT	josemanuel.urman@fiaccount.buet.ac.bd

Solution:

```
select first_name, last_name, job_id,
    lower(replace(replace(
      (first_name || '.' || last_name || '@' || job_id || '.buet.ac.bd'),
    ' ',''),'_','')) as dept_mail
from hr.employees
where instr(last_name,' ') <> 0 or instr(first_name,' ') <> 0;
```

Problem 3:

If the company begins offering a 2% extra commission to employees with over 15 years of service (and no commission for others), how much total commission will the company need to pay to its employees based on the EMPLOYEES table? For example, If an employee has worked no more than 15 years, he gets 0% commission. Otherwise, if he gets 3% commission, now he'll get 5% commission; and if he gets a null commission he'll get 2% commission now.

Solution:

```
select sum(salary*(NVL(COMMISSION_PCT, 0)+0.02)) as TOTAL_COMMISSION_NOW
from hr.employees
where (sysdate-hire_date)/365 > 15;
```

Problem 4:

Find the total number of employees hired in each triennial period (every three years, for example: 2001-2003) for each job type. Sort them **in descending chronological order**. Example output:

TRIENNIAL_PERIOD	JOB_ID	EMPLOYEES_HIRED
2007-2009	FI_ACCOUNT	1
2007-2009	IT_PROG	2
...	...	...
2001-2003	ST_CLERK	2
2001-2003	ST_MAN	1

Solution:

```
SELECT
    ((TRUNC(TO_CHAR(HIRE_DATE, 'yyyy')/3) * 3)) || '-' ||
(((TRUNC(TO_CHAR(HIRE_DATE, 'yyyy')/3)+1) * 3)-1) AS TRIENNIAL_PERIOD,
    JOB_ID,
    COUNT(EMPLOYEE_ID) AS EMPLOYEES_HIRED
FROM
    HR.EMPLOYEES E
GROUP BY
    TRUNC(TO_CHAR(HIRE_DATE, 'yyyy')/3),
    JOB_ID
ORDER BY TRUNC(TO_CHAR(HIRE_DATE, 'yyyy')/3) DESC;
```

Problem 5:

For each department, print the number of employees that receive salary higher than 6500 and the number of employees that receive salary not higher than 6500. Print the result for only those departments that have less people with salary more than 6500 than people with salary no more than 6500.
Example output:

DEPARTMENT_ID	COUNT_MORE_THAN_6500	COUNT_NO_MORE_THAN_6500
50	3	42
30	1	5
10	0	1
60	1	4

Solution:

```
SELECT
    DEPARTMENT_ID,
    SUM(CASE WHEN SALARY > 6500 THEN 1 ELSE 0 END) AS
COUNT_MORE_THAN_6500,
    SUM(CASE WHEN SALARY > 6500 THEN 0 ELSE 1 END) AS
COUNT_NO_MORE_THAN_6500
FROM HR.EMPLOYEES
GROUP BY DEPARTMENT_ID
HAVING SUM(CASE WHEN SALARY > 6500 THEN 1 ELSE 0 END) < SUM(CASE WHEN
SALARY > 6500 THEN 0 ELSE 1 END);
```

Online 1 (Basic SQL)

Section: A
Duration: 50 minutes

Problem 1:

Show all the employees' last name, hiring date and total monthly compensation (SALARY+SALARY*COMMISSION_PCT) who are hired between '01-JAN-2000' and '31-DEC-2022' and have a salary greater than 6000 or a non-NULL commission percentage in descending order of their total monthly compensation and then ascending order of their hiring date.

Solution:

```
SELECT LAST_NAME, HIRE_DATE, (SALARY+SALARY*COMMISSION_PCT) SALCOMM
FROM EMPLOYEES
WHERE (HIRE_DATE BETWEEN '01-JAN-2000' AND '31-DEC-2022') AND (SALARY >
6000 OR COMMISSION_PCT IS NOT NULL)
ORDER BY SALCOMM DESC, HIRE_DATE ASC;
```

Problem 2:

In our HR.EMPLOYEES table, it has a column called PHONE_NUMBER which has numbers separated with dots. For example

PHONE_NUMBER
515.123.4567
515.123.4568

Assume that the first part of the phone number before the “.” indicates country code, and the second part of the phone number between the first two “.””s indicate the region code.
Now, extract the country code and region code from the phone numbers. Example output:

PHONE_NUMBER	COUNTRY_CODE	REGION_CODE
515.123.4567	515	123
515.123.4568	515	123
...	...	...
011.44.1344.619268	011	44
011.44.1344.429018	011	44

Solution:

```
select
    phone_number,
    substr(phone_number, 0, instr(phone_number,'.')-1) country_code,
    substr(substr(phone_number,instr(phone_number,'.')+1), 0,
      instr(substr(phone_number,instr(phone_number,'.')+1),'.')-1
    ) region_code
from hr.employees;
```

Problem 3:

Find the average number of years an employee works as a "ST_CLERK" based on the JOB_HISTORY table.

Solution:

```
select avg(end_date-start_date)/365
from hr.job_history
where job_id='ST_CLERK';
```

Problem 4:

The phone numbers of each employee has one of the following two formats:

a. Three parts (numbers) separated with two dots, for example: `515.123.4567`
b. Four parts separated with three dots, for example: `011.44.1344.429268`

Suppose if the number is of type (a), the regional contact through which the employee can be contacted consists of the first **two** parts of the number (e.g. `515.123`). If the number is of type (b), the regional contact consists of the first **three** parts (e.g. `011.44.1344`). Find the total number of employees in each such region that are based on the regional contacts, and sort them all **in decreasing order of the number of employees**.Example output:

REGIONAL_CONTACT	TOTAL_EMPLOYEES_IN_REGION
011.44.1344	11
515.123	9
...	...
650.509	4
603.123	1

Solution:

```
SELECT
  CASE
    WHEN LENGTH(PHONE_NUMBER) - LENGTH(REPLACE(PHONE_NUMBER, '.', '')) = 2 THEN
      SUBSTR(PHONE_NUMBER, 1, INSTR(PHONE_NUMBER, '.', 1, 2) - 1)
    WHEN LENGTH(PHONE_NUMBER) - LENGTH(REPLACE(PHONE_NUMBER, '.', '')) = 3 THEN
      SUBSTR(PHONE_NUMBER, 1, INSTR(PHONE_NUMBER, '.', 1, 3) - 1)
    ELSE
      'INCORRECT NUMBER'
  END AS REGIONAL_CONTACT,
  COUNT(EMPLOYEE_ID) AS TOTAL_EMPLOYEES_IN_REGION
FROM
  HR.EMPLOYEES
GROUP BY
  CASE
    WHEN LENGTH(PHONE_NUMBER) - LENGTH(REPLACE(PHONE_NUMBER, '.', '')) = 2 THEN
      SUBSTR(PHONE_NUMBER, 1, INSTR(PHONE_NUMBER, '.', 1, 2) - 1)
    WHEN LENGTH(PHONE_NUMBER) - LENGTH(REPLACE(PHONE_NUMBER, '.', '')) = 3 THEN
      SUBSTR(PHONE_NUMBER, 1, INSTR(PHONE_NUMBER, '.', 1, 3) - 1)
    ELSE
      'INCORRECT NUMBER'
  END
ORDER BY TOTAL_EMPLOYEES_IN_REGION DESC;
```

Problem 5:

For each manager, print the number of employees he manages and the total commission of those employees (COMMISSION = SALARY * COMMISSION_PCT). Print result for only those managers for which total commissions of his managed employees is positive.
Example output:

MANAGER_ID	COUNT_MANAGED	TOTAL_COMMISSION
145	6	11775
146	6	16375
...	...	...
100	14	18650
147	6	6710

Solution:

```
SELECT MANAGER_ID, COUNT(*) AS COUNT_MANAGED, SUM(SALARY * NVL(COMMISSION_PCT, 0))
AS TOTAL_COMMISSION
FROM HR.EMPLOYEES
GROUP BY MANAGER_ID
HAVING SUM(SALARY * NVL(COMMISSION_PCT, 0)) > 0;
```