BISHOP STUART UNIVERSITY

# UNDERGRATE EXAMINATIONS, FIRST SEMESTER 2022/2023

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| PROGRAMME: | **BSCED2** |
| COURSE UNIT: | Database management and information retrieval |
| **COURSE CODE:** | **BLIS3105 /BSCED2** |
| DATE: | Saturday 18TH FEB 2023 |
| TIME: | 4:00PM – 7:00PM |

**Instructions:**

1. Section A is compulsory **(60Mks)**
2. Answer four question from six questions provided.
3. Each question in section B carries 20 marks
4. Begin each question on a new page
5. All answers must be written on answer booklet provided to you
6. **DO NOT** write anything on this Question Paper.
7. Ensure that you have no mobile phone with you.
8. Follow the instructions of the Examination Supervisors & Invigilators.
9. Any form of examination malpractice will result into the cancellation of your exam.
10. No extra time will be given to you.

## PRACTICAL SECTION A: Compulsory (60marks)

**Question one: Use Microsoft Access as a database Management Software**

Create a folder "STUDENTS PAYEMENTS" on the desktop

BSU has hired you to manage their database. Below are the databases in two tables "**Students payments details**" and "**department**". Analyze them and answer the questions that follow.

**Students payments details**

| SN | RegNo | SName | LName | Science Tuition | Hostel Allowance | DEPTC0de | Department | Tuition |
|---|---|---|---|---|---|---|---|---|
| 1 | 22/BSU/001 | COLLINS | MAFABI | | | P01 | Physics | 840000 |
| 2 | 22/BSU/001 | AMON | KIIZA | | | C05 | Chemistry | 560000 |
| 3 | 22/BSU/001 | ROSE | KEMIGISHA | | | M02 | Mathematics | 897000 |
| 4 | 22/BSU/001 | JOY | ANYELLO | | | P01 | Physics | 756990 |
| 5 | 22/BSU/001 | ALEXANDA | ATIM | | | E06 | Economics | 235000 |
| 6 | 22/BSU/001 | COHEN | NATUNDA | | | B03 | Biology | 985000 |
| 7 | 22/BSU/001 | CATHY | ASIO | | | C05 | Chemistry | 700500 |
| 8 | 22/BSU/001 | SAUL | KATO | | | B03 | Biology | 345100 |
| 9 | 22/BSU/001 | BENARD | BYARYA | | | C05 | Chemistry | 650000 |
| 10 | 22/BSU/001 | HAPPY | NYAMATE | | | P01 | Physics | 600,000 |

**Department**

| Deptcode | Department |
|---|---|
| P01 | Physics |
| M02 | Mathematics |
| B03 | Biology |
| C04 | Chemistry |
| E05 | Economics |

i. Create a database "**STUDENTS** " into the folder you created on the desktop. **(02Mks)**

ii. Create the tables "**Student payments details** " with the fields of names SN, RegNo, SName, Gender, Date of Birth(DOB), DEPTcode, department, Tuition, them to appropriate data types and assign a primary key to an appropriate field and table **Department with fields DEPTcode and department.** **(04Mks)**

iii. Create a relationship between the two tables, enforce referential integrity. **(02Mks)**

iv. If you're a science student, Hostel allowance is 17% of Total Tuition, Science allowance is 12% of the Total Tuition and therefore, the Science tuition will be payless the deductions of Total Tuition . Create a query that shows the computed Science tuition. Note, a student is considered science if you belong to the department of Chemistry, Biology, Mathematics, Computer Science and Physics. Name it "SCIENCE TUTION". **HINT: Use calculated query field** **(06Mks)**

v. Create a columnar form you can use to populate the database using the **Students payments details table** **(08Mks)**

vi. Create a query showing all details of only STUDENTS with SCIENCE TUITION Name Science Query **(04Mks)**

vii. Generate a report in landscape showing all students details in table student payments details. Name it students' payments Report **(04Mks)**

**Question Two:** The sample data is about the employment of the staff in the ministry of public service. Use it to answer the following questions.

| Employee No | Name | Job Tittle | Experience (Years) | Salary Scale | Salary Amount |
|---|---|---|---|---|---|
| 50 | Claire | Economist | 4 | M7 | 1800000 |
| 100 | Faridah | Statistician | 6 | M5 | 1200000 |
| 200 | Victor | Statistician | 3 | M6 | 800000 |
| 300 | Hadijah | Consultant | 15 | M4 | 700000 |
| 400 | Violet | Accountant | 10 | M6 | 900000 |
| 500 | Sarah | Economist | 6 | M5 | 1800000 |
| 600 | Paul | Accountant | 1 | M5 | 1200000 |
| 700 | Fiona | Manager | 10 | M4 | 800000 |
| 800 | Filpa | Economist | 7 | M5 | 700000 |
| 900 | Topher | Accountant | 8 | M6 | 800000 |
| 1000 | Deo | Statistician | 4 | M7 | 900000 |

a) Create database using xamp/wamp name it (YOUR NAME) **04Mks**

b) Create the table named Employee **04Mks**

c) Add the records in the table named Employee **10Mks**

d) use this table to write different SQL Queries **10Mks**

i. Query 1 : List the employee whose employee number is 100.

ii. Query 2 : List the Employee whose salary is between 500,000 to 1,000,000

iii. Query 3 : List the Employees whose Job Title is Economist.

iv. Query 4 : List the Employees whose name has letter "A" and Salary scale is M5.

v. Query 5 : List the Employees whose name contains letter " O".

e) **Note: write all your SQL codes on the answer sheets** **02Mks**

**THEORY SECTION B(40): Attempt only two questions @ 20Marks**

**Question three** ✓

a) With examples describe a database **02Mks**

b) Mention the four main characteristics of the database approach? **08Mks**

c) Explain the advantages of using of a database in information Management **10Mks**

**Question four**

a) Write down the functions of DBMS **06Mks**

b) Describe the situations when DBMS should not be used? **08Mks**

c) Explain the structural components (3) of a DBMS. **06Mks**

**Question Five** ✓

a) Give three examples of database management programs you know **03Mks**

b) Identify any 5 areas where databases are applied **05Mks**

c) Explain the disadvantages of electronic databases over manual databases **12Mks**

04Mks
10Mks
10Mks

**Question Six: Given the sql code below;**

```
CREATE TABLE STUDENT(
ROLL_NO  INT  NOT NULL CHECK(ROLL_NO >1000) ,
STU_NAME VARCHAR (35)  NOT NULL UNIQUE,
STU_AGE INT  NOT NULL,
EXAM_FEE INT DEFAULT 10000,
STU_ADDRESS VARCHAR (35) ,
PRIMARY KEY (ROLL_NO)
);
```

a) Write down the meaning of the following as used in database management **@02Marks**

i. Default value
ii. Null
iii. VARCHAR
iv. Primary key
v. CHECK

b) Explain why the database designer should do the following; **@02Marks**

i. Roll back statement
ii. Transaction log
iii. Update
iv. Insert
v. Create

**The end** **Good Luck**

## SECTION B (60 marks)

### Question 2

a) SQL is a transform-oriented language with 2 major components. Explain the two components. **(4 marks)**

b) Explicitly differentiate and explain 'Reserved words' and 'User-defined words' as used in DBMS. **(4 marks)**

c) Give the output of the following components in a Select statement. **(@ 2 marks)**

FROM
WHERE
GROUP BY
HAVING
SELECT
ORDER BY

### Question 3

a) With an example, explain what you understand by a subquery and give its rules. **(10 marks)**

b) **Attempt i) or ii)**

i) Assume there are two tables Route and Bus, explain and show the structure of the output of the sql statement bellow. **(10 marks)**

```
INSERT INTO RouteBusCount
        (SELECT r.RouteNo, Distance, Destination, COUNT(*)
        FROM Route r, Bus b
        WHERE r.RouteNo = b.RouteNo
        GROUP BY RouteNo, Distance, Destination)
        UNION
        (SELECT RouteNo, Distance, Destination
        FROM Route
        WHERE RouteNo NOT IN
                (SELECT DISTINCT RouteNo
                FROM Bus));
```

**OR**

ii) Explain the following statement and show its output with reference to the table Farm and table Animal below. **(10 marks)**

```
SELECT Name, Location, Manager, Size
        FROM Farm
        WHERE Name =
            (SELECT Farm
             FROM Animal
             WHERE Type = 'Cow';
```

**Farm**

| Name | Manager | Size | Location |
|---|---|---|---|
| IBO | Innocent | 764 | Kashari |
| NSHARA | Shilbert | 357 | Nyabushozi |
| KABIHURA | Jabil | 492 | Rubirizi |
| JED | Nissi | 583 | Sheema |

**Animal**

| Farm | Type | Number |
|---|---|---|
| JED | Goat | 69 |
| IBO | Cow | 24 |
| KABIHURA | Fish | 20450 |

fence to tab
(10 marks)

## Question 4

**Table Employee**

| | Emp_Id | f_name | l_name | Department | Position | Salary (Ug Sh) | Voter_Id |
|---|---|---|---|---|---|---|---|
| 1 | AC15 | DENIS | KUNU | Accounts | Accounts Asistant | 470,000 | VA0324 |
| 2 | RG01 | HAM | GURIRA | Registry | Registrar | 700,000 | VR0132 |
| 3 | CTR04 | ERIC | BAMUKA | Catering | Head cook | 200,000 | VC0534 |
| 4 | ES07 | PARTRICK | MPAHA | Estates | States officer | 250,000 | VE0096 |
| 5 | AC21 | JACK | REEBA | Accounts | Casheir | 470,000 | VA0072 |
| 6 | LIB02 | FLAVIA | ZOONA | Library | Librarian | 650,000 | VL0832 |
| 7 | RG05 | NICK | NYAMUKANO | Registry | Asistant Registrar | 635,000 | VR0763 |
| 8 | AC12 | LAURA | MBABAZI | Accounts | Accounts Clerk | 470,000 | VA0213 |
| 9 | LIB24 | GRACE | TUMUHE | Library | Library attendant | 156,500 | VL0219 |
| 10 | CTR01 | DAN | NZIZI | Catering | Caterer | 235,000 | VC0423 |
| 11 | ES23 | JOAN | TAMUGAMBAHO | Estates | Sweeper | 123,000 | VE0099 |
| 12 | CTR22 | BEN | NGUGU | Catering | Cook | 123,000 | VC0271 |
| 13 | RG13 | KELLEN | MBABAZI | Registry | Secretary | 342,000 | VR0317 |
| 14 | LIB23 | BERNARD | MUZIMUHEREZE | Library | Library attendant | 130,350 | VL0648 |
| 15 | AC02 | TOM | AKAFAKI | Accounts | Bursar | 684,500 | VA0647 |
| 16 | AC05 | DARIUS | GAREBE | Accounts | Auditor | 684,500 | VA0635 |
| 17 | CTR33 | BONY | BABONEIRE | Catering | Cook | 123,000 | VC0273 |
| 18 | LIB27 | FLAVIA | KANDISHI | Library | Library attendant | 130,350 | VL0652 |
| 19 | ES25 | MARYZ | MISHENYI | Estates | Messenger | 123,000 | VE0517 |
| 20 | RG11 | SARAH | SASIRA | Registry | Secretary | 342,000 | VR0773 |

a) From table Employee write an sql statement where for each Department with more than 3 employees, find number of employees (Number) in each department and sum of their salary (Total) and show the output. **(8 marks)**

b) From table Employee write an sql statement and show the output for:
   i. Number of employees (STAFF) whose position is library attendant and the sum of their salaries (BILL). **(6 marks)**
   ii. Minimum (Min), Maximum (Max), and Average (Avg) of salary. **(6 marks)**

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## Question 5

a) Define the five ISO standard aggregate functions **(@ 2 marks)**

b) Ankole Coffee Producers Cooperative Union (ACPCU) has a team of staff whose information is given in the table Team below.

**Team**

| Emp_Id | l_name | Department | Salary (Ug Sh) | Voter_Id |
|---|---|---|---|---|
| AC15 | KUNU | Accounts | 470,000 | VA0324 |
| RG01 | GURIRA | Registry | 700,000 | VR0132 |
| CTR04 | BAMUKA | Catering | 200,000 | VC0534 |
| ST07 | MPAHA | Sorting | 250,000 | VE0096 |
| PR21 | REEBA | Processing | 470,000 | VA0072 |
| ST02 | ZOONA | Sorting | 650,000 | VL0832 |
| RG05 | NYAMUKANO | Registry | 635,000 | VR0763 |
| PR12 | MBABAZI | Processing | 470,000 | VA0213 |
| ST 24 | TUMUHE | Sorting | 156,500 | VL0219 |
| CTR01 | NZIZI | Catering | 235,000 | VC0423 |
| ST23 | TAMUGAMBAHO | Sorting | 123,000 | VE0099 |
| CTR22 | NGUGU | Catering | 123,000 | VC0271 |
| PR13 | MBABAZI | Processing | 342,000 | VR0317 |
| ST23 | MUZIMUHEREZE | Sorting | 130,350 | VL0648 |
| AC02 | AKAFAKI | Accounts | 684,500 | VA0647 |

The chairman BoD wants to know how many staff earn more than the average salary and the total of their salaries. Write an sql statement that will give the required information. **(10 marks)**

a team of staff whose

**...on 6**

**...base name:** employees_db

**...le name:** employees

| emp_id | first_name | last_name | email | salary |
|---|---|---|---|---|
| 1 | Steven | King | steven.king@yahoo.com | 24000 |
| 2 | Neena | Kochhar | neena.kochhar@gmail.com | 17000 |
| 3 | Lex | De Haan | lex.de haan@ gmail.com | 17000 |
| 4 | Alexander | Hunold | alexander.hunold@git.org | 9000 |
| 5 | Bruce | Ernst | bruce.ernst@ yahoo.com | 6000 |
| 6 | David | Austin | david.austin@ gmail.com | 4800 |

Write the SQL statement that inserts the above records into 'employee' table. (6 marks)

**Write SQL statement for the following (@ 2 marks)**

i. Query all employees.
ii. Query email, first_name, last_name, salary.
iii. Write a query that returns the number employees.
iv. Query salaries only and should not include duplicates.
v. Query all employees' details with their salaries increased by 2%.
vi. Update all employee's salaries whose salary is less than 15000 to 17500.
vii. Find the average of employee's salaries whose salary is with the range 5000 to 20000.

**Question 7**

**Table name:** Jobs

| Job_id | Job_title | Min_salary | Max_salary |
|---|---|---|---|
| 1 | Public Accountant | 4200.00 | 9000.00 |
| 2 | Accounting Manager | 8200.00 | 16000.00 |
| 3 | Administration Assistant | 3000.00 | 6000.00 |
| 4 | President | 20000.00 | 40000.00 |
| 5 | Administration Vice President | 15000.00 | 30000.00 |
| 6 | Accountant | 4200.00 | 9000.00 |
| 7 | Finance Manager | 8200.00 | 16000.00 |
| 8 | Human Resources Representative | 4000.00 | 9000.00 |
| 9 | Programmer | 4000.00 | 10000.00 |
| 10 | Marketing Manager | 9000.00 | 15000.00 |

**Write an SQL statement for the following;**

1. Query all job records whose min_salary is 9000. **(2 marks)**
2. Query job_titles, and max_salary whose min_salary ranges from 9000 to 20000. **(2 marks)**
3. Query all job records whose job_title includes any of the following (Programmer, Administration Assistant, Finance manager, Purchasing manager, Marketing manager, President and Purchasing Clerk) **(3 marks)**
4. Fetch all job records whose job_title contains character 'e'. **(2 marks)**
5. Fetch all job records whose job_title follows the following patterns;
   a. Contains exactly 10 characters. **(2 marks)**
   b. Made two or more words. **(2 marks)**
6. Fetch all job records whose max_salary is greater than 10000 and order the results by the max_salary starting from the highest to the smallest. **(3 marks)**
7. Update all employees' max_salary whose min_salary is less than 7000 to 20000. **(4 marks)**