UNIVERSITY EXAMINATIONS: 2020/2021
EXAMINATION FOR DEGREE IN BACHELOR OF SCIENCE
INFORMATION TECHNOLOGY/ INFORMATION SECURITY AND
FORENSICS/APPLIED COMPUTING/SOFTWARE DEVELOPMENT
BIT 2104/BSD 1306/BISF 1301/BAC 1301: DATABASE DESIGN AND
DEVELOPMENT
MODE: PART TIME/FULL TIME/DISTANCE LEARNING
ORDINARY EXAMINATIONS
DATE: APRIL.2021   TIME: 3 HOURS

INSTRUCTIONS: Answer **QUESTION ONE** and any other **TWO**

QUESTION ONE [20 MARKS]

AFYA pharmacy is a medicine dispensing shop located along Biashara Street in Nairobi room 12 fourth floor Eucalyptus towers. The daily operations of the pharmacy are documented in a flat file system:

- Receive and validate prescription from the patient/customer.
- Search for the prescribed medicine from the data base
- Packaging and labelling the medicine as per the prescription
- Billing the customer/ patient for the prescription
- Processing the payment for the prescription
- Issue the medicine and educate the patient/customer on the appropriate use of the medication
a) Identify possible entities and relationships in this case

5 Marks

b) Produce a conceptual data model for this case

5 Marks

c) For each entity in a) identify corresponding attributes and perform normalization up to third normal form.

10 Marks

d) Construct a logical data model after normalization.

5 Marks

QUESTION TWO [15 MARKS]

Consider the data dictionary below for a patient diagnosis case. Use this dictionary to answer questions a-e.

Table	Attributes	Data type	Length	Primary key?	Foreign key?
Patient	PatientID	INT	8	Yes	No
	Fname	Varchar	100	No	No
	Surname	Varchar	100	No	No
	Age	Int	10	No	No
Diagnosis	D_ID	INT	8	Yes	No
	Type	Varchar	150	No	No
	Fee	Decimal	10	No	No
	PatientID	INT	8	No	Yes

a) Implement the above database using MySQL.

5 Marks

b) Create a trigger to be fired each time a new record is added to diagnosis table

3 Marks

c) Create a new user called cashier who can add, select and update records in this database.

3 Marks

d) Create a transaction for adding, updating and deleting a record in patient table. The transaction allows the user to rollback to some specified save points.

4 Marks

QUESTION THREE [15 MARKS]

a). A music database stores details of a personal music library and could be used to manage your mp3, CD or vinyl collection. The collection consists of albums. An album is made by exactly one artist but an artist can make one or more albums. An album contains one or more tacks but each track is on exactly one album. The artists, albums and tracks each have a name. **Required**: Produce a conceptual data model complete with optionalities and cardinalities using crow's foot notation.

8 Marks

b). Consider the table schema Player->(PlayerID, Firstname, Secondname, Address, Allowance).

Write DML statements for each of the following tasks.

i. To increase allowances of the players by 3%.

ii. Create a view to display all players from "London".

iii. Add a new column to store age of the player.

iv. A stored procedure to increase allowance by 4% for players below 25 years.

7 Marks

QUESTION FOUR [15 MARKS]

Consider the database schema below and answer the questions that follow using SQL.

EMPLOYEE->(EmpID,Firstname,Lastname,Hows_worked, Salary, SupervisorID,DepartmentID)

DEPENDANT->(DependantID,Firstname,Lastname,Age,EmpID)

SUPERVISOR->(SupervisorID,Firstname,Lastname,Address)

DEPARTMENT->(DepartmentID,departmentname)

  i.   Retrieve all employees in "sales department" whose salary is between Ksh 30,000 and Ksh 80,000.

  ii.   Retrieve the names of all employees in "marketing department" who work more than 10 hours and are supervisedd by "Fredrick Khamati".

  iii. List the names of all employees who have a dependent with the same first name as themselves.

  iv.   Retrieve all supervisors whose address is in "Nanyuki".

  v.   For each department, retrieve the departmentID, the number of employees in the department, and their average salary.

  vi.   Using a stored procedure,increase employee salary by 3% if his/her salary is below Ksh 20000

15 Marks