SIT103
Database and Information Retrieval

Revision Paper

Section A- MCQ

1. A collection of related fields is called a:
   A. database
   B. File
   C. record
   D. relation

2. Also known as online, this type of processing occurs at the same time as the transaction occurs.
   A. direct
   B. immediate
   C. method
   D. **real-time**

3. The part of the database management system that provides tools for maintaining and analyzing data is known as the:
   A. **data manipulation subsystem**
   B. organizational data subsystem
   C. processing subsystem
   D. SQL

   5. A specialized database programming language:
   A. Ajax
   B. Java
   C. C++
   D. **SQL**

4. Which of the following items is not the advantage of a DBMS?
   A. Improved ability to enforce standards
   B. Improved data consistency
   C. Local control over the data
   D. Minimal data redundancy

5. What is the correct ***(from the BIGGEST piece to the LOWEST piece)*** hierarchical order for a database management system?
   A. `Database > Record > Field > Table`
   B. `Table > Record > Field > Database`
   C. `Database > Table > Field > Record`
   D. `Record > Field > Table > Database`
   E. `Database > Table > Record > Field`

6. Suppose relation R(A,B,C,D,E) has the following functional dependencies:

   $A \rightarrow B$

$B \rightarrow C$
$A \rightarrow D$
$A \rightarrow$CD
$D \rightarrow E$

Which of the following is ***the*** key?

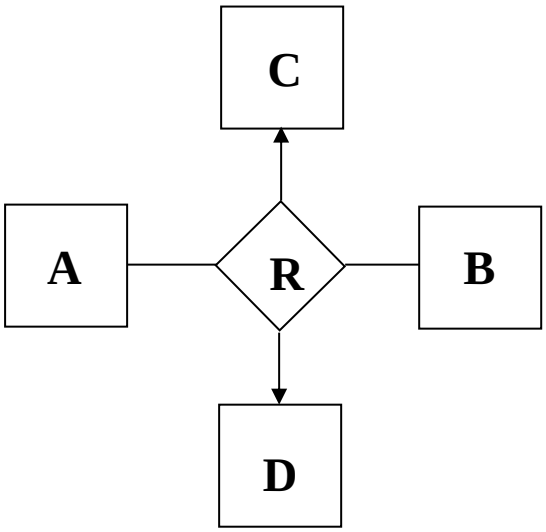
(a) A

(b) E

(c) B,C

(d) D

7. Consider the following E/R diagram:



What is this relationship

A. Binary
B. Unary
C. N-Ary
D. Ternary

8. How many primary keys we can have in a table ?
A. One
B. Two
C. Three
D. Zero

9. What is the full form of SQL?

A. Structured Query Language

B. Structured Query List
C. Simple Query Language
D. None of them

10. Which is the subset of SQL commands used to manipulate Oracle Database structures, including tables?

A. Data Definition Language
B. Data manipulation Language
C. Queries
D. None of the above

11. Which operator performs pattern matching?

A. Between
B. And
C. Like
D. In

12. What operator tests column for the absence of data?

A. EXISTS
B. NOT
C. IS NULL
D. None of these

13. In SQL, which command(s) is(are) used to change a table's storage characteristics?

A. ALTER
B. MODIFY
C. CHANGE
D. None of the above

14. In SQL, which command is used to SELECT only one copy of each set of duplicable rows

A. SELCT UNIQUE
B. SELECT DISTNCT
C. SELECT ONLY
D. NONE of the above

15. Which of the SQL statements is correct?

A. SELECT Username AND Password FROM Users
B. SELECT Username, Password FROM Users
C. SELECT Username, Password WHERE Username = 'user1'
D. None of the above

16. The FROM SQL clause is used to...

A. specify what table we are selecting or deleting data FROM

B. specify range for search condition
C. specify search condition
D. None of these

17. Ensuring atomicity and durability properties is responsibility of the

A. Recovery manager
B. Buffer manager
C. Transaction manager
D. File manager

18. Commit and rollback are related to …….
A. data integrity
B. data consistency
C. data sharing
D. data security
19. …… property will check whether all the operation of a transaction completed or none.
A. Atomicity
B. Consistency
C. Isolation
D. Durability
20. The transaction wants to edit the data item is called as …….
A. Exclusive Mode
B. Shared Mode
C. Inclusive Mode
D. Unshared Mode

Section B – SQL

Consider the following relational schema. An employee can work in more than one department; the pct-time field of the Works relation shows the percentage of time that a

given employee works in a given department.

Emp(eid: integer, ename: string, age: integer, salary: real)
Works(eid: integer, did: string, pct-time: integer)
Dept(did: string, budget: real, managerid: integer)

Write the following queries in SQL:

a. Print employee id, name, and salary.

```
SELECT eid, ename, salary FROM Emp
```

b. Print the managers name, department and salary of the departments got more than 200000.

```
SELECT ename, did, salary FROM Emp e , Depat d WHERE e.eid = d.managerid
AND budget > 200000
```

c. Print the names and ages of each employee who works in both the Hardware department and the Software department.

```
SELECT E.name, E.age FROM Emp E, Works W WHERE E.eid = W.wid AND W.did
= "Hardware" AND E.eid IN
(SELECT W.eid FROM Works W WHERE W.did = "Software") OR

SELECT E.name, E.age FROM Emp E, Works W1, Works W2 WHERE E.eid =
W1.eid AND W1.did = 'Hardware'AND E.eid = W2.eid AND W2.did = 'Software'
```

d. Find the enames of managers who manage the departments with the largest budget.

```
SELECT E.ename FROM Emp E, Dept D1 WHERE E.eid = D1.managerid AND
D1.budget IN (SELECT MAX (D2.budget) FROM Dept D2)
```

e. If a manager manages more than one department, he or she controls the sum of all the budgets for those departments. Find the managerid of managers who control more than $5,000,000.

```
SELECT D.managerid FROM Dept D GROUP BY D.managerid HAVING
SUM(D.budget) > 5,000,000
```

f. Find the managerids of managers who manage only departments with budgets greater than $1,000,000.

```
SELECT DISTINCT D1.managerid FROM Dept D1 WHERE D1.budget > 1,000,000
AND NOT EXISTS (SELECT * FROM Dept D2 WHERE D2.managerid =
D1.managerid AND D2.budget <= 1,000,000)
```

g. Write SQL statement to create Works table.

```
CREATE TABLE Works(
Eid  Number,
Did Varchar(15),
Pct_time Number,
Primary Key (eid, did),
Foreign key(eid) references emp,
Foreign key (did) references dept )
```

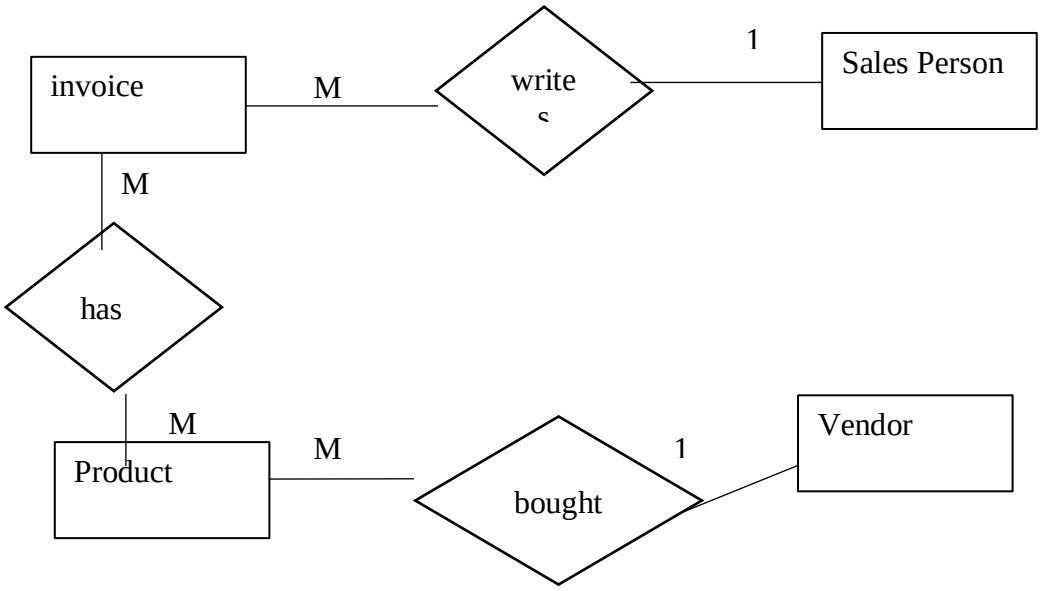
h. Write SQL statement to insert values to Dept table

```
Insert into Dept Values("HRD",200000.00, 25 );
```

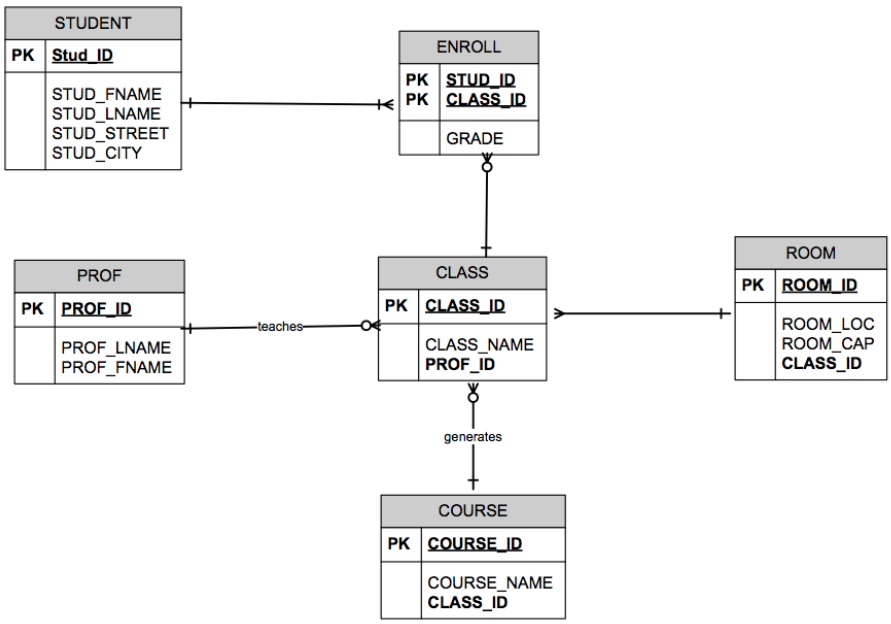
Section C – Database Design & Normalisation

a. Draw Entity Relationship Diagram for following requirement

A. an invoice is written by one sales representative but a sales representative writes many invoices
B. a vendor sells many products but a product is bought from one vendor
C. an invoice has one or many products and a product is found on zero, one or many invoices



b. Map following ERD to relational model.



Student(**studentid**, studentFame, StudentLname,studentstreet,studentCity)

Enrol(**studID,ClassID,** grade)

Prof(**ProfID,** ProfLname,ProfFname)

Class(**ClassID**, ClassName, profId)

Room(**RoomID,** RoomLoc, RoomCap,ClassID)

Course(**Course_ID,** CourseName, classID)

Perform normalisation for the following scenario.

Order Form

Order number: 1234 Date: 11/04/98

Customer number: 9876

Customer name: Billy

Customer address: 456 HighTower Street

City–Country: Hong Kong, China

ProductNo	Desscription	Quantity	Unit Price
A123	Pencil	100	$3.00
B234	Eraser	200	$1.50
C345	Sharpener	5	$8.00

- 0NF
  - ORDER(order#, customer#, name, address, orderdate{product#, description, quantity, unitprice})
- 1NF
  - ORDER(order#, customer#, name, address, orderdate)
  - ORDER_LINE(order#, {product#, description, quantity, unitprice})
- 2NF
  - ORDER(order#, customer#, name, address, orderdate)
  - ORDER_LINE(order#, product#, quantity)
  - PRODUCT(product#, description, unitprice)
- 3NF
  - ORDER(order#, customer#, orderdate)
  - CUSTOMER(customer#, name, address)
  - ORDER_LINE(order#, product#, quantity)
  - PRODUCT(product#, description, unitprice)