SLIATE
SRI LANKA INSTITUTE OF ADVANCED TECHNOLOGICAL EDUCATION
(Established in the Ministry of Higher Education, vide in Act No. 29 of 1995)

Higher National Diploma in Information Technology
First Year, First Semester Examination – 2017
HNDIT 1105- Database Management System / Introduction to Relational Database Management System
Answer Script

Q1).

I. A software system that enables users to define, create and maintain the database and which provides controlled access to the database.
   (02 marks)

II. Inconsistent data
   Data duplication
   Security
   Inflexibility
   Limited data sharing
   Excessive program maintenance
   (Any 03 answers, 03 marks)

III. capacity planning
   Installation
   Configuration
   Database design
   Migration
   Performance monitoring
   Security
   Troubleshooting
   Backup and data recovery
   (Any 03 answers, 05 marks)

IV. Minimal data redundancy
Efficient data access
Data integrity and security
Data administration
Concurrent access, recovery from crashes
Reduced application development time
(Any 05 answers, 05 marks)

V.

a.
Self-describing nature of a database system
(02 marks)
A DBMS catalog stores the description of the database. It include metadata.
(03 marks)

b.
Support of multiple views of the data
(02 marks)
Each user may see a different view of the database, which describes only the data of interest to that user.
(03 marks)
(Total 25 marks)

Q2).

I. Hierarchical
Network
Relational
Object-oriented
(Any 02 answers, 02 marks)

II.

a. Internal Schema
Describes physical storage structures
Access paths, indexes used
Typically uses a physical data model
(01 marks)

b. Conceptual schema
Describes the logical structure and constraints for the whole database for a community of users.

Uses a conceptual or an logical data model

(01 marks)

c. External schema

Many views describe how users see data

Information about schemas is stored in the system catalog

(01 marks)

III.

a. Logical Data Independence

The capacity to change the conceptual schema without having to change the external schemas and their application programs.

(02 marks)

b. Physical Data Independence

The capacity to change the internal schema without having to change the conceptual schema.

(02 arks)

IV.

a. DDL

CREATE

ALTER

DROP

(Any 02 answers, 02 marks)

b. DML

UPDATE

DELETE

INSERT

SELECT

(Any 02 answers, 02 marks)

c. DCL

REVOKE

GRANT

(Any 02 answers, 02 marks)

V.

A	B	C	D	E	F	G	H	I	J
Text	Text	Currency	Numbers	Numbers	Text	Yes/No	Date	Hyperlink	Text

(Each answer 01 marks, 10 marks)
(Total 25 marks)

Q3).

I.   Domain of Attribute
The domain of an attribute specifies the set of possible values that the attribute can have.
(01 marks)

Candidate key
A candidate key is a column, or set of columns, in a table that can uniquely identify any database record without referring to any other data.
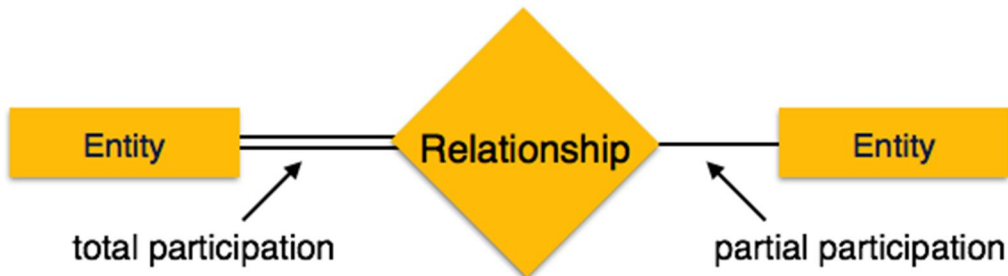**(01 marks)**

II.
EID
EName
Age
Qualification
(Each answer 01 marks, 04 marks)

III.   Total Participation − each entity is involved in the relationship. Total participation is represented by double lines.
Partial participation − Not all entities are involved in the relationship. Partial participation is represented by single lines.

(04 marks)

IV.

Manufacturer

name	city	street

Part

Part_num	description	name

Part_Orders

Part_num	Order_num	quantity

Order

Order_num	ID

Customer

ID	name

Correct relations=05 marks
Correct primary key and foreign keys= 01 marks
(06 marks)

V.

Identify the entities
 Worker
  Department
  Project
Buyorder
  Product
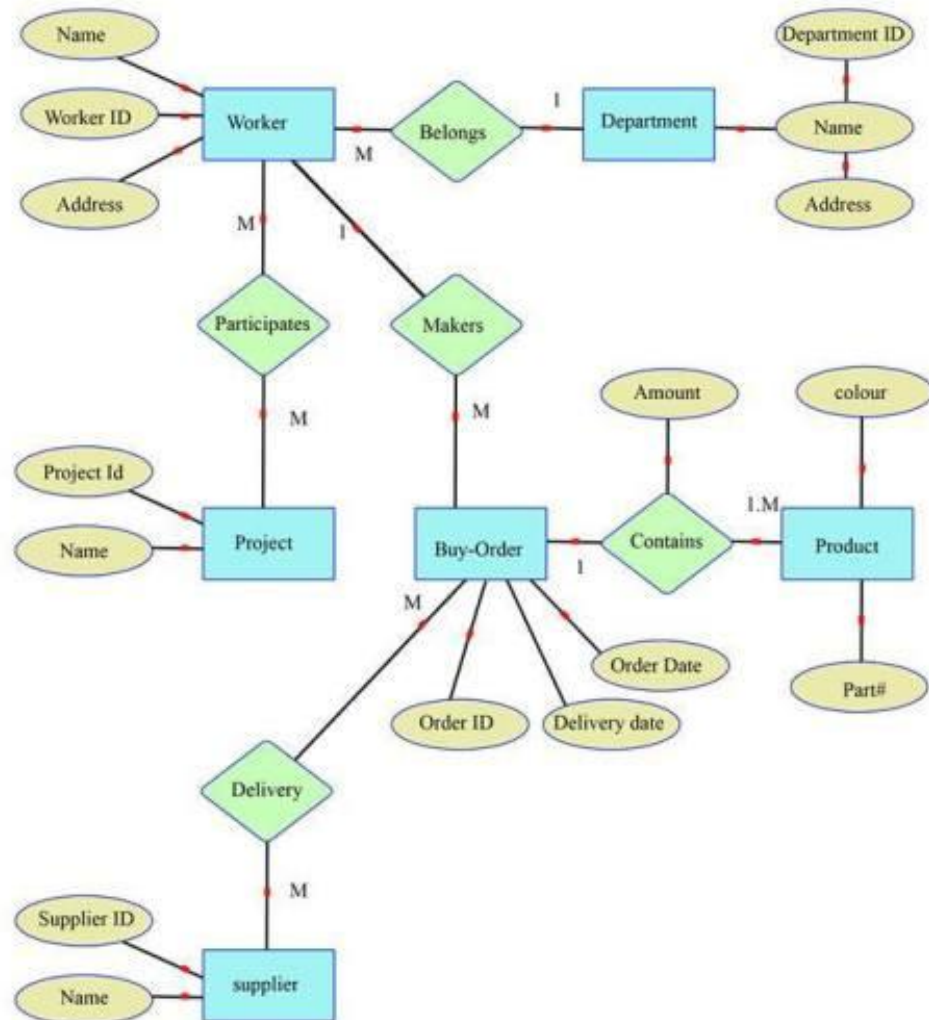 Supplier

Identify the relations
Many workers may belongs to single department.
Many workers may participate in many projects.
A single worker can make many buyorders.
A single buyorder may contain many products.
Many buyorders can be delivered by many Suppliers.

Identify Entity= 03 marks
Identify Relationship= 03 marks
Identify cardinality ratio= 03 marks

(Total 25 marks)

Q4).

I. A FOREIGN KEY is a key used to link two tables together. A FOREIGN KEY is a field (or collection of fields) in one table that refers to the PRIMARY KEY in another table.
(02 marks)

II. DROP statement is used to remove a table definition and all the data, indexes, triggers, constraints and permission specifications for that table.
DELETE statement is used to delete the existing records from a table.
(03 marks)

III. a.
```
create table Products
(
Pid char(05) primary key,
Pname varchar(25),
Pprice real,
Pqty int,
Pexpiredate date
);
```
(04 marks)

b.
```
create table Orders
(
Oid char(05) primary key,
Odate date,
Oamount real,
Oprocess varchar(25)
);
```
(04 marks)

c.
```
create table Shipping
(
Pid char(05),
Oid char(05),
primary key(Pid,Oid),
foreign key(Pid) references Products(Pid),
foreign key(Oid) references Orders(Oid)
);
```
(04 marks)

d.
```
insert into Products values('P1234','Fresh milk',230.50,12,'24/03/2018');
insert into Products values('P2245','Canned fish',330.00,15,'08/06/2019');
```
(04 marks)

e.
```
update Products
set Pprice=370.00
where Pid='P2245';
```
(02 marks)

f.
```
Alter table Products
add column category varchar(25);
```
(02 marks)

(Total 25 marks)

Q5).

   I.   SQL GRANT is a command used to provide access or privileges on the database objects to the users.
The REVOKE command removes user access rights or privileges to the database objects.
(02 marks)

   II.   a.
```
select Sname,SGPA from Students;
```
(03 marks)

b.
```
select Sname
from Students
where SGPA> 3.00;
```
(03 marks)

c.
```
select Cno,count(Sno) as number of student
from Students
group by(Cno);
```
(03 marks)

d.
```
select Sname,SGPA,Cname
from Students s1 inner join Courses c1
on s1.Cno=c1.Cno;
```

Or

```
select Sname,SGPA,Cname
from Students,Courses
where Students.Cno=Courses.Cno;
```

(03 marks)

e.
```
select *
from Students
order by SGPA asc;
```

(03 marks)

III.

1NF

A relation is in first normal form (1NF) if every intersection of row and column contains atomic values only. It means that the relation does not contain any repeating group. Each cell in a relation should contain only one value.

(02 marks)

2NF

If in a relation every non key attribute is dependent on the primary key and if this relation is in 1NF then this relation will be a 2NF relation. All non-key attributes must depend on all parts of the primary key.

(02 marks)

IV.   a.
1NF

Student	Age	Subject
Adam	15	Biology
Adam	15	Maths
Alex	14	Maths
Stuart	17	Maths

(02 marks)

b.

2NF

New Student Table following 2NF will be :

Student	Age
Adam	15
Alex	14
Stuart	17

New Subject Table introduced for 2NF will be :

Student	Subject
Adam	Biology
Adam	Maths
Alex	Maths
Stuart	Maths

(02 marks)

(Total 25 marks)