**1)Using object-oriented databases create the following types**

**A)create**

Create or replace type AddrType as object( Pincode number(5),

Street char(20), City varchar2(50), state varchar2(40), no number(4) );

create or replace type BranchType as object( address AddrType,

phone1 integer, phone2 integer );

create or replace type BranchTableType as table of BranchType;

create or replace type AuthorType as object( name varchar2(50),

addr AddrType );

create table authors of AuthorType;

create or replace type AuthorListType as varray(10) of ref AuthorType;

create or replace type PublisherType as object( name varchar2(50),

addr AddrType, branches BranchTableType);

create table Publishers of PublisherType NESTED TABLE branches STORE as branchtable;

create table books( title varchar2(50), year date,

published\_by ref PublisherType, authors AuthorListType);

**B)insert**

**Authors---**

insert into Authors values('stallings', AddrType(5002,'sstreet','pune','mha',04));

insert into Authors values('stallings', AddrType(7007,'sstreet','mumbai','mha',1007));

insert into Authors values('Navathe', AddrType(7008,'nstreet','nasik','mha',08));

insert into Authors values('Dhumdhare',AddrType(7003,'dstreet','mumbai','mha',1003));

insert into Authors values('Dhumdhare', AddrType(7008,'sstreet','mumbai','mha',1007));

**Publishers--**

insert into Publishers values('tata',AddrType(4002,'rstreet','mumbai','mha',03), BranchTableType(BranchType(AddrType(5002,'fstreet','mumbai', 'mha',03),23406,69896)));

insert into Publishers values('seth', AddrType(7007,'sstreet','mumbai','mha',1007), BranchTableType(BranchType( AddrType(7007,'sstreet','mumbai','mha',1007),4543545,8676775)));

insert into Publishers values('joshi', AddrType(7008,'sstreet','mumbai','mha',1007), BranchTableType(BranchType( AddrType(1002,'sstreet','nasik','mha',1007),456767,7675757)));

insert into Publishers values('seth',AddrType(7002,'sstreet','pune','mha',1007), BranchTableType(BranchType( AddrType(1002,'sstreet','pune','mha',1007),4543545,8676775)));

insert into Publishers values('chetana', AddrType(6002,'sstreet','nasik','mha',1007), BranchTableType(BranchType( AddrType(6002,'sstreet','nasik','mha',1007),4543545,8676775)));

**books--**

insert into books

select 'java','28-may-1983',ref(pub),AuthorListType(ref(aut)) from

Publishers pub,Authors aut where pub.name='joshi' and aut.name='Dhanovan'

insert into books

select 'java','28-may-1983',ref(pub),AuthorListType(ref(aut)) from

Publishers pub,Authors aut where pub.name='chetana' and aut.name='stallings';

insert into books

select 'compiler','09-jan-1890',ref(pub),AuthorListType(ref(aut)) from Publishers pub,Authors aut where pub.name='chetana' and aut.name='Dhanovan';

insert into books

select 'c','25-may-1983',ref(pub),AuthorListType(ref(aut)) from

Publishers pub,Authors aut where pub.name='tata' and aut.name='stallings';

**a) List all of the authors that have the same pin code as their publisher:**

select a.name

from Authors a,Publishers p

where a.addr.pincode = p.addr.pincode;

**b)List the name of the publisher that has the most branches**

select p.name

from Publishers p,table(p.branches) group by p.name having count(\*)>= all(select count(\*)

from Publishers p,table(p.branches) group by name);

**c)Name of authors who have not published a book**

select a.name from Authors a

where not exists( select b.title from books b, table(b.Authors) where a.name = name);

# 2.Create Book\_type by grouping the information Bookno, Title, and Author. Create table Purchase with Pid, book\_details, date, amount. Insert five records in Purchase Table.

**Create-**

create or replace type Book\_Type as object( Bookno number(10),

Title varchar (50), Author varchar(50)

) ;

create table Purchese( Pid number(10),

book\_detail Book\_Type, PDate date,

amount number(10,2)

);

**Insert--**

insert into Purchese values(01,

Book\_Type(101,'A Place Called Home','Preeti Shenoy'), '20-jan-2022',360.50);

insert into Purchese values(02,

Book\_Type(150,'Anand Math','Bankimchandra Chattopadhyay'), '23-feb-2022',400.00);

insert into Purchese values(03, Book\_Type(130,'Arthashastra','Kautilya'), '23-feb-2022',200.00);

insert into Purchese values(04, Book\_Type(190,'Mein Kampf','Adolf Hitler'), '28-feb-2022',600.00);

insert into Purchese values(05,Book\_Type(145,'The Vicar of Wakefield',' Oliver Goldsmith'), '13-mar-2022',150.00);

**select \* from Purchese;**

# 3.Create a table customer with the attributes cust\_no, cust\_name, product and price. Create an ADT name\_type with the attribute fname, mname and lname to store the name details. Display the first name of the customer who purchased&Monitor.

create or replace type name\_type as object( fname varchar(20),

mname varchar(20), lname varchar(20)

);

create table customer( cust\_no number(20), cust\_name name\_type, product varchar(20), price number(20)

);

insert into customer values(101,name\_type ('Aditi','tanaji','shinde'),'mouse',650);

insert into customer values(102,name\_type ('Aishwarya','nilesh','mayekar'),'Monitor',9000);

insert into customer values(103,name\_type ('Vaishnavi','Vikas','Shinde'),'key board',1050);

insert into customer values(104,name\_type ('ashwini','narayan','shirke'),'Monitor',9050);

insert into customer values(105,name\_type ('sakshi','sunil','gore'),'CPU',6050);

select c.cust\_name.fname,c.product from customer c where product='Monitor';

# 4.Create person type with attributes person\_id, person\_name and person\_addr. Create a person\_obj table of person type. Insert and display the details of the table.

create or replace type person as object( person\_id number(10),

person\_name varchar(20), person\_addr varchar(50)

);

create table person\_obj of person;

insert into person\_obj values(1,'Kavita','Ratnagiri'); insert into person\_obj values(2,'Kamal','Rajapur'); insert into person\_obj values(3,'Kiran','Lanja');

insert into person\_obj values(4,'Madhuri','Mumbai'); insert into person\_obj values(5,'Manali','Thane'); select \* from person\_obj;

# 5.Create type rectangle with attributes length, breadth and member function rect\_area that

**returns area of the rectangle. Create table shape of rectangle type &amp; insert record into it. Display the length, breadth and area of rectangles.**

create or replace type rectangle as object (

length number(20), breadth number(20),

member function rect\_area return number

)not final;

CREATE TYPE BODY rectangle AS

MEMBER FUNCTION rect\_area RETURN NUMBER IS BEGIN

RETURN length \* breadth; END;

END;

create table rect of rectangle; INSERT INTO rect

values(rectangle(20,30)); SELECT \* FROM rect;

select r.rect\_area() from rect r;

# 6.Create supertype person\_typ with attributes id, name, phone\_no and member function show that returns id and name of the person. Create table person of person\_typ and insert records into it and display id and name of person using show function. Create subtype student\_type of spertype person\_typ with attributes dept\_id and major. It has member function show that overrides member function of person\_typ and returns the major of student. Create table student of student\_type and insert record into it and display major of the student using show function.

create type person\_typ as object (

pid number(20), pname varchar(30), phone\_no number(20),

MEMBER FUNCTION id RETURN number,

MEMBER FUNCTION name RETURN varchar

)not final;

create type BODY person\_typ AS member function id return number is

begin

return pid; end;

member function name return varchar is BEGIN

return pname; end;

END;

create table person of person\_typ; insert into person values (person\_typ(1,'niranjan','9671177332'));

insert into person values (person\_typ(2,'Harshal','9671338332')); insert into person values (person\_typ(3,'mithilesh','8985494944')); insert into person values (person\_typ(4,'vaishnavi','7589895986')); insert into person values (person\_typ(5,'janhavi','7847598734'));

select \* from person;

create type student\_typ under person\_typ( dept\_id number(20),

major varchar2(30),

overriding member function name return varchar

)not final;

CREATE TYPE BODY student\_typ AS

OVERRIDING MEMBER FUNCTION name RETURN varchar IS BEGIN

RETURN 'student\_typ'; END;

END;

create table student\_type of student\_typ; insert into student\_type

values(student\_typ(5,'janhavi','7847598734',101,'sawant'));

select s.name() from student\_type s;

select \* from student\_type;