**Problem Sheet – VI (MADHUMITHA.S - 19PW13)**

CREATE TABLE EMP

(

Empno INT,

Empname VARCHAR(30),

Empsalary INT,

Deptname VARCHAR(30) NULL,

Bossno INT NULL,

PRIMARY KEY (Empno),

FOREIGN KEY (Bossno) REFERENCES EMP (Empno)

);

CREATE TABLE DEPARTMENT

(

Deptname VARCHAR(30) PRIMARY KEY,

Deptfloor INT,

Deptphone INT,

MgrId INT NOT NULL,

FOREIGN KEY (MgrId) REFERENCES EMP (Empno)

);

CREATE TABLE ITEM

(

itemname VARCHAR(30) PRIMARY KEY,

itemtype CHARACTER,

itemcolor varchar(10)

);

CREATE TABLE SALES

(

Salesno INT PRIMARY KEY,

Saleqty INT,

itemname varchar(30) NOT NULL,

Deptname VARCHAR(30) NOT NULL,

FOREIGN KEY (itemname) REFERENCES ITEM (itemname),

FOREIGN KEY (Deptname) REFERENCES DEPARTMENT (Deptname)

);

INSERT INTO EMP

VALUES (1, 'Alice ', 75000, 'Management', NULL),

(2, 'Ned', 45000, 'Marketing', 1),

(3, 'Andrew', 25000, 'Marketing', 2),

(4, 'Clare', 22000, 'Marketing', 2),

(5, 'Todd', 38000, 'Accounting', 1),

(6, 'Nancy', 22000, 'Accounting', 5),

(7, 'Brier', 43000, 'Purchasing', 1),

(8, 'Sarah', 56000, 'Purchasing', 7),

(9, 'Sophile', 35000, 'Personnel', 1),

(10, 'Sanjay', 15000, 'Navigation', 3),

(11, 'Rita', 15000, 'Books', 4),

(12, 'Gigi', 16000, 'Clothes', 4),

(13, 'Maggie', 11000, 'Clothes', 4),

(14, 'Paul', 15000, 'Equipment', 3),

(15, 'James', 15000, 'Equipment', 3),

(16, 'Pat', 15000, 'Furniture', 3),

(17, 'Mark', 15000, 'Recreation', 3);

INSERT INTO DEPARTMENT

VALUES ('Management', 5, 34, 1),

('Books', 1, 81, 4),

('Clothes', 2, 24, 4),

('Equipment', 3, 57, 3),

('Furniture', 4, 14, 3),

('Navigation', 1, 41, 3),

('Recreation', 2, 29, 4),

('Accounting', 5, 35, 5),

('Purchasing', 5, 36, 7),

('Personnel', 5, 37, 9),

('Marketing', 5, 38, 2);

ALTER TABLE EMP

ADD FOREIGN KEY (Deptname) REFERENCES DEPARTMENT (Deptname);

INSERT INTO ITEM

VALUES ('Pocket Knife-Nile', 'E', 'Brown'),

('Pocket Knife-Avon', 'E', 'Brown'),

('Compass', 'N', NULL),

('Geo positioning system', 'N', NULL),

('Elephant Polo stick', 'R', 'Bamboo'),

('Camel Saddle', 'R', 'Brown'),

('Sextant', 'N', NULL),

('Map Measure', 'N', NULL),

('Boots-snake proof', 'C', 'Green'),

('Pith Helmet', 'C', 'Khaki'),

('Hat-polar Explorer', 'C', 'White'),

('Exploring in 10 Easy Lessons', 'B', NULL),

('Hammock', 'F', 'Khaki'),

('How to win Foreign Friends', 'B', NULL),

('Map case', 'E', 'Brown'),

('Safari Chair', 'F', 'Khaki'),

('Safari cooking kit', 'F', 'Khaki'),

('Stetson', 'C', 'Black'),

('Tent - 2 person', 'F', 'Khaki'),

('Tent -8 person', 'F', 'Khaki');

INSERT INTO SALES

VALUES (101, 2, 'Boots-snake proof', 'Clothes'),

(102, 1, 'Pith Helmet', 'Clothes'),

(103, 1, 'Sextant', 'Navigation'),

(104, 3, 'Hat-polar Explorer', 'Clothes'),

(105, 5, 'Pith Helmet', 'Equipment'),

(106, 2, 'Pocket Knife-Nile', 'Clothes'),

(107, 3, 'Pocket Knife-Nile', 'Recreation'),

(108, 1, 'Compass', 'Navigation'),

(109, 2, 'Geo positioning system', 'Navigation'),

(110, 5, 'Map Measure', 'Navigation'),

(111, 1, 'Geo positioning system', 'Books'),

(112, 1, 'Sextant', 'Books'),

(113, 3, 'Pocket Knife-Nile', 'Books'),

(114, 1, 'Pocket Knife-Nile', 'Navigation'),

(115, 1, 'Pocket Knife-Nile', 'Equipment'),

(116, 1, 'Sextant', 'Clothes'),

(117, 1, 'Sextant', 'Equipment'),

(118, 1, 'Sextant', 'Recreation'),

(119, 1, 'Sextant', 'Furniture'),

(120, 1, 'Pocket Knife-Nile', 'Furniture'),

(121, 1, 'Exploring in 10 easy lessons', 'Books'),

(122, 1, 'How to win foreign friends', 'Books'),

(123, 1, 'Compass', 'Books'),

(124, 1, 'Pith Helmet', 'Books'),

(125, 1, 'Elephant Polo stick', 'Recreation'),

(126, 1, 'Camel Saddle', 'Recreation');

1. Display the number of departments in department table.

SELECT DISTINCT COUNT(\*) FROM DEPARTMENT;

2. Display all department managers’ details.

SELECT \* FROM EMP

WHERE Empno IN

(SELECT MgrId FROM DEPARTMENT);

3. Display the items name, total qty sold item wise.

SELECT itemname, SUM(Saleqty) FROM SALES

GROUP BY itemname ;

4. Find all items of type E and F.

SELECT \* FROM ITEM

WHERE itemtype = 'E' OR itemtype = 'F';

5. Find all items whose color value is null.

SELECT \* FROM ITEM

WHERE itemcolor IS NULL;

6. Display the maximum number of items having the same color.

SELECT itemcolor, COUNT(\*) FROM ITEM

WHERE itemcolor IS NOT NULL

GROUP BY itemcolor

ORDER BY 2 DESC

LIMIT 1;

7. Find all items with type code in the range E to K and color is Khaki or Brown.

SELECT \* FROM ITEM

WHERE (itemtype BETWEEN 'E' AND 'K')

AND (itemcolor = 'Khaki' OR itemcolor = 'Brown');

8. Find all items with type E or N and Color Brown.

SELECT \* FROM ITEM

WHERE (itemtype = 'E' OR itemtype = 'N')

AND (itemcolor = 'Brown');

9. Are there any items with a code of R? If found, display the details.

SELECT \* FROM ITEM

WHERE itemtype = 'R';

10. List red items.

SELECT \* FROM ITEM

WHERE itemcolor = 'Red';

11. Find red items of type C.

SELECT \* FROM ITEM

WHERE itemcolor = 'Red' AND itemtype = 'C';

12. Find the items that have same name with different color.

SELECT I1.itemname, I2.itemname FROM ITEM I1, ITEM I2

WHERE I1.itemname = I2.itemname AND I1.itemcolor <> I2.itemcolor ;

13. Find all items with a name starting with ‘S’; or ‘P’.

SELECT \* FROM ITEM

WHERE itemname LIKE 'S%' OR itemname LIKE 'P%';

14. Find all item names containing ‘Knife’ in their name.

SELECT \* FROM ITEM

WHERE itemname LIKE '%knife%';

15. Find item with ‘t’; as the third letter of their name.

SELECT \* FROM ITEM

WHERE itemname LIKE '\_\_t%';

16. Report all clothing items, for which a sale is recorded.

SELECT DISTINCT itemname FROM

(SELECT \* FROM ITEM

WHERE itemtype = 'C') T1

NATURAL JOIN SALES;

17. Report all clothing items.

SELECT \* FROM ITEM

WHERE itemtype = 'C';

18. Report all clothing items that have not been sold.

SELECT itemname FROM ITEM

WHERE itemtype = 'C'

AND itemname NOT IN

(SELECT itemname FROM SALES);

19. Find the items that have appeared in all sales.

SELECT itemname

FROM SALES

GROUP BY itemname HAVING COUNT(DISTINCT Deptname) = (SELECT COUNT(DISTINCT Deptname) FROM DEPARTMENT);

20. List items that are brown.

SELECT \* FROM ITEM

WHERE itemcolor = 'Brown';

21. List the names of items for which the quantity sold is greater than one.

SELECT DISTINCT \* FROM SALES

WHERE Saleqty > 1;

22. Compare the total quantity of sales for each item.

SELECT itemname, SUM(Saleqty)

FROM SALES

GROUP BY itemname

ORDER BY SUM(Saleqty);

23. Report all furniture items that have been sold.

SELECT \* FROM

(SELECT itemname FROM ITEM

WHERE itemtype = 'F') T1

NATURAL JOIN

SALES;

24. List all items that appear in sales with saleno between 107 to 112 or 121 to 126.

SELECT DISTINCT itemname FROM SALES

WHERE Salesno BETWEEN 107 AND 112

OR Salesno BETWEEN 121 AND 126;

25. Find the total sold value of each department.

SELECT Deptname, SUM(Saleqty)

FROM SALES

GROUP BY Deptname;

26. Find the names of green items sold by the recreation department.

SELECT \* FROM

(SELECT itemname FROM ITEM

WHERE itemcolor = 'Green') T1

NATURAL JOIN SALES

WHERE Deptname = 'Recreation';

27. Find the items not sold to the Books department.

SELECT \* FROM

(SELECT DISTINCT itemname FROM SALES

WHERE Deptname <> 'Books') T1

NATURAL JOIN

ITEM ;

28. Find the departments that have never sold a geo positioning system.

SELECT \* FROM DEPARTMENT

WHERE Deptname NOT IN

(SELECT DISTINCT DeptName FROM SALES

WHERE itemname = 'Geo positioning system');

29. Find the departments that have sold compasses and at least two other items.

SELECT Deptname FROM SALES

WHERE Deptname IN (SELECT DISTINCT Deptname FROM SALES WHERE itemname = 'Compass')

GROUP BY Deptname

HAVING COUNT(DISTINCT itemname) > 2;

30. Find the departments that sell at least four items.

SELECT deptname FROM SALES

GROUP BY deptname

HAVING COUNT(\*) >= 4;

31. Find the employees who are in a different department from their manager’s department.

SELECT \* FROM EMP e

WHERE

((SELECT Deptname FROM EMP

WHERE Empno = e.Bossno) <> e.Deptname);

32. Find the employees whose salary is less than half that of their manager’s.

SELECT \* FROM EMP e

WHERE

((SELECT Empsalary/2 FROM EMP

WHERE Empno = e.Bossno) > e.Empsalary);

33. Find the green items sold by no department on the second floor.

SELECT I.\* FROM ITEM I

INNER JOIN SALES S USING (itemname)

INNER JOIN DEPARTMENT D USING (Deptname)

WHERE (itemcolor = 'Green'

AND Deptfloor = 2);

34. Find the items sold by at least two departments.

SELECT \* FROM

(SELECT itemname FROM SALES

GROUP BY itemname

HAVING COUNT(itemname) > 1) T1

NATURAL JOIN ITEM;

35. Find the items sold to all departments except clothes and books.

SELECT \* FROM SALES

WHERE Deptname NOT IN ('Clothes', 'Books');

36. Find the names of the highest paid employee in the marketing department.

SELECT Empname FROM EMP

WHERE Deptname = 'Marketing'

ORDER BY Empsalary DESC

LIMIT 1;

37. Find the names of employees who make 10 percent less than the average salary.

SELECT \* FROM EMP

WHERE Empsalary <= 0.9 \*

(SELECT AVG(Empsalary) FROM EMP);

38. Find the names of employees with a salary greater than the minimum salary paid to a

manager.

SELECT \* FROM EMP

WHERE Empsalary >

(SELECT MIN(Empsalary) FROM EMP

WHERE Empno IN

(SELECT DISTINCT Bossno FROM EMP));

39. Find the names of department that do not sell compasses or geo positioning systems.

SELECT Deptname FROM DEPARTMENT

WHERE Deptname NOT IN (

SELECT DISTINCT Deptname FROM SALES

WHERE Itemname IN ('Compass', 'Geo positioning system'));

40. Find the names of employees with a salary under $10,000.

SELECT Empname FROM EMP

WHERE Empsalary < 10000;

41. Find the number of items of type E sold by the departments on the third floor.

SELECT COUNT(\*) FROM (ITEM I

INNER JOIN SALES USING (itemname)

INNER JOIN DEPARTMENT USING (Deptname))

WHERE itemtype = 'E' AND

Deptfloor = 3;

42. Find the number of units sold of each item.

SELECT itemname, SUM(Saleqty) FROM SALES

GROUP BY itemname;

43. Find the green items sold to all departments.

SELECT itemname

FROM ITEM

WHERE itemcolor = 'Green'

AND itemname IN (SELECT itemname

FROM SALES

GROUP BY itemname

HAVING COUNT(DISTINCT Deptname) = (SELECT COUNT(DISTINCT Deptname) FROM SALES));

44. Find the departments that sell no more than one item.

SELECT Deptname FROM SALES

GROUP BY Deptname

HAVING COUNT(\*) < 2;

45. Find the items that sell to all departments.

SELECT itemname

FROM SALES

GROUP BY itemname

HAVING COUNT(DISTINCT Deptname) = (SELECT COUNT(DISTINCT Deptname) FROM SALES);

46. Find the departments that have never sold a compass.

SELECT Deptname FROM DEPARTMENT

WHERE Deptname NOT IN

(SELECT Deptname FROM SALES

WHERE itemname = 'Compass');

47. Find, for each department, its floor and the average salary in the department.

SELECT Deptname, Average\_Salary, Deptfloor FROM

((SELECT Deptname, AVG(Empsalary) as "Average\_Salary" FROM EMP

GROUP BY Deptname) D1

NATURAL JOIN DEPARTMENT);

48. If Nancy’s boss has a boss, who is it?

SELECT \* FROM EMP

WHERE Empno =

(SELECT Bossno FROM EMP

WHERE Empno =

(SELECT Bossno FROM EMP

WHERE Empname = 'Nancy'));

49. List each employee and difference between his (her) salary and the average salary of his(her) department.

SELECT Empname, Empsalary - Avg AS "Difference FROM

(T1) T2;SELECT \* FROM EMP

NATURAL JOIN

(SELECT Deptname, AVG(Empsalary) AS "Avg"

FROM EMP

GROUP BY Deptname)

50. List the department on the second floor that contains more than one employee.

SELECT Deptname, COUNT(\*) FROM (

SELECT \* FROM (DEPARTMENT

INNER JOIN EMP USING (Deptname))

WHERE Deptfloor = 2) T1

GROUP BY Deptname

HAVING COUNT(\*) > 1;

51. List the departments on the second or fifth floor.

SELECT Deptname FROM DEPARTMENT

WHERE Deptfloor = 2 OR Deptfloor = 5;

52. List the names of employees who earn more than the average salary of employees on the Books department.

SELECT Empname FROM EMP

WHERE Empsalary > (SELECT AVG(Empsalary) FROM EMP

WHERE Deptname = 'Books');

53. List the names of managers who supervise only one person.

SELECT Empname FROM EMP

WHERE Empno IN

(SELECT Bossno FROM EMP

WHERE Bossno IS NOT NULL

GROUP BY Bossno

HAVING COUNT(\*) = 1);

54. Whom does Todd manage?

SELECT \* FROM EMP

WHERE Bossno =

(SELECT Empno FROM EMP

WHERE Empname = 'Todd');

55. List the departments that have not sold all green items.

SELECT DISTINCT Deptname FROM SALES

WHERE Deptname NOT IN

(SELECT Deptname FROM SALES S

INNER JOIN ITEM I USING (itemname)

WHERE itemcolor = 'Green'

GROUP BY (S.Deptname)

HAVING COUNT(\*) = (SELECT COUNT(\*) FROM ITEM

WHERE itemcolor = 'Green'));

56. Find the first name of Sophie’s boss.

SELECT Empname FROM EMP

WHERE Empno =

(SELECT Bossno FROM EMP

WHERE Empname = 'Sophile');

57. Find the names of employees who make less than half their manager’s salary.

SELECT \* FROM EMP e

WHERE (Empsalary <

(SELECT Empsalary/2 FROM EMP

WHERE Empno = e.Bossno));

58. List the names of each manager and their employees arranged by manager’s name and employee’s name within manager.

SELECT B.Empname AS Manager, E.Empname AS Employee FROM EMP E

INNER JOIN EMP B ON E.Bossno = B.Empno

ORDER BY Manager, Employee;

59. Who earns the lowest salary?

SELECT \* FROM EMP

WHERE Empsalary =

(SELECT MIN(Empsalary) FROM EMP);

60. List the names of employees who earn less than the minimum salary of the marketing Department.

SELECT \* FROM EMP

WHERE Empsalary <

(SELECT MIN(Empsalary) FROM EMP

WHERE Deptname = 'Marketing');

61. List the items sold by every department that is delivered all brown items.

SELECT DISTINCT S.itemname

FROM SALES S

NATURAL JOIN ITEM I

WHERE I.itemcolor = 'Brown';

62. List the brown items sold by the Books department.

SELECT \* FROM ITEM

NATURAL JOIN SALES

WHERE Itemcolor = 'Brown' AND Deptname = 'Books';

63. Which department has the highest average salary?

SELECT \* FROM

(SELECT Deptname, AVG(Empsalary) AS "Avg"

FROM EMP

GROUP BY Deptname) T1

ORDER BY Avg DESC

LIMIT 1;

64. List the departments that have sold all and only brown items.

SELECT Deptname FROM SALES S

NATURAL JOIN ITEM I

WHERE I.itemcolor = 'Brown'

GROUP BY (Deptname)

HAVING COUNT(\*) = (SELECT COUNT(\*) FROM ITEM WHERE itemcolor = 'Brown');

65. Find, for each department that sells item sextant, the average salary of the employees.

SELECT Deptname, AVG(Empsalary) FROM EMP

WHERE Deptname IN

(SELECT Deptname FROM SALES

WHERE Itemname = 'Sextant')

GROUP BY Deptname;

66. Find the items that sell at least two departments.

SELECT itemname FROM SALES

GROUP BY itemname

HAVING COUNT(DISTINCT Deptname) > 1;

67. Find the departments where the average salary of the employees of each manager is more than 25,000.

SELECT Boss.Deptname

FROM EMP Emp

INNER JOIN EMP Boss

WHERE Emp.Bossno = Boss.Empno

GROUP BY Boss.Empno

HAVING AVG(Emp.Empsalary) > 25000;

68. Among all the departments with total salary greater than 25,000 and, find the departments that sell Stetsons.

SELECT \* FROM

((SELECT Deptname, SUM(Empsalary) FROM EMP

GROUP BY Deptname

HAVING SUM(Empsalary) > 25000) T1

NATURAL JOIN SALES)

WHERE Itemname = 'Stetson';

69. For each item give the departments, that sell the items, the floor location of these departments, employees name.

SELECT itemname, Dept.Deptname, Deptfloor, Empname

FROM SALES

INNER JOIN DEPARTMENT Dept USING (Deptname)

INNER JOIN EMP E ON Dept.MgrId = E.Empno;

70. Find the names of items sold on floors other than the second floor.

SELECT DISTINCT Itemname FROM DEPARTMENT

NATURAL JOIN SALES

WHERE Deptfloor <> 2;