assigment one
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Distrete methematics

Q1: Question No = 1

Recursive Relations =

Answer No = 1

Recurrsive Relations.

When we define a set recursively, we specify some initial elements in a ~~defi~~ basic step and provide a rule for constructing new elements from those we already have in the recursive step.

Sometimes it is difficult to define an object explicity However, it may be easy to define this object in terms of itself this is called Recursive

In some recursive definitions of functions, the values of the function at the functions at the first K positive integers are specified, and a rule is given for determining the value of the functions at larger intergers from its values at some or all of the preceding K integer.

Question NO 2

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Consider:

Premsies-

How many elements are in the union of two finite sets? in Section we showed that the number of elements in the union of the two sets. A and B is the sum of the numbers of elements in the sets minus the elements in their intersection.

$$|A \cup B| = |A| + |B| - |A \cap B|$$

As we showed in section 6.1, the formula for the number of elements in the union of two sets is useful in counting problems. Example 1-3 provide additional illustrations of the usefulness of this formula.

In a discrete mathematics class every student is a major in computer science or mathematics or both. The number of students having computer science a a major possibly along with mathematics the numbers of students having mathematics as a major possibly along with computer science

Date: __/__/20

Q4 Pigeon Hole Principal:-

If K is a positive integer and K+1 or more objects are placed into K boxes, then there is is at least one box containing two or more of the objects

Explanation:-

The Pigeon hole principle is also called the Drichlet drawer Principle. The pigeonhole Principle states that if there are more Pigeons than pigeonholes then there must be at least one pigeonhole with at least two pigeons in it. This principle applies to other objects besides pigeons and pigeonholes.

Examples:

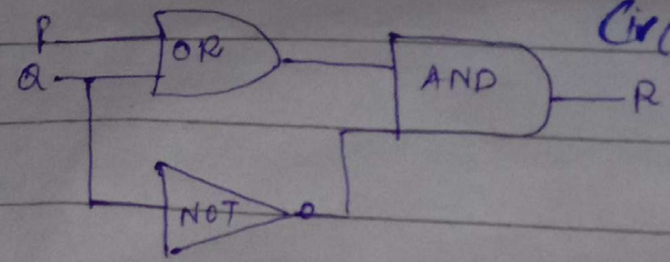
1. Suppose that a flock of 20 pigeons flies into a set of 19 pigeonholes to roost. Because there are 20 pigeons in it but only 19 pigeonholes, at least one of these 19 pigeonholes must

have at least two pigeons in it.

(2) Among any group of 367 people, there must be at least two with the same birthday, because there are only 366 possible birthdays.

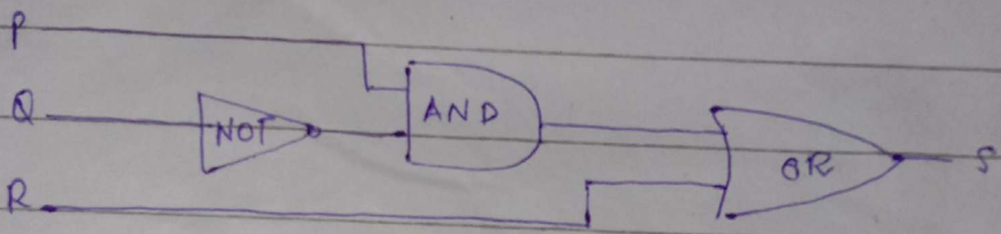
Give the output signals for the circuit

Q7



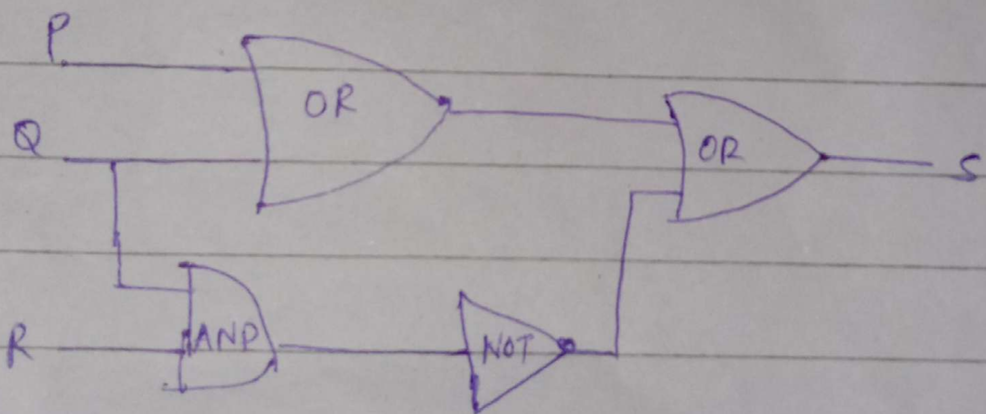
Input P=1, Q=0

Output: R= 1



Input: P=1, Q=0, R=0

Output: S=1



Input: P=0, Q=0, R=0

Output:

S=1

Question = 8.

R1: {(0,0), (0,1), (0,3), (1,1), (1,0)
(1,0) (2,3), (3,3)}

Relation is not reflexive
Relation is not Symmetric
Relation is not transitive.

Q2 R2: {(0,0), (0,1), (1,1), (1,2) (2,2), (2,3)}

Relation not reflexive
Relation not Symmetric
Relation not transitive.

3 R3: {(2,3), (3,2)}

Relation not reflexive
Relation not Symmetic
Relation is not transitive.

4 R4: {(1,2), (2,1), (1,3), (3,1)}

Not Reflexsive
- Relation is symmetic
- Relation, not transitive.

5 R5: {(0,0), (0,1), (0,2), (1,2)}

Not Reflentive
Not Symmetic
Relation is transitive

6 $R6 = \{(0,1), (0,2)\}$

- Not Reflentive
- Not Symmetric
- Not transitive

7 $R7 = \{(0,3), (2,3)\}$

- Not Reflexive
- Not Symmetic
- Net transitive

8 $R8 = \{(0,0), (1,1)\}$

- Not Reflexsive
- Not Symmetric
- Not transitive

Question No. 9

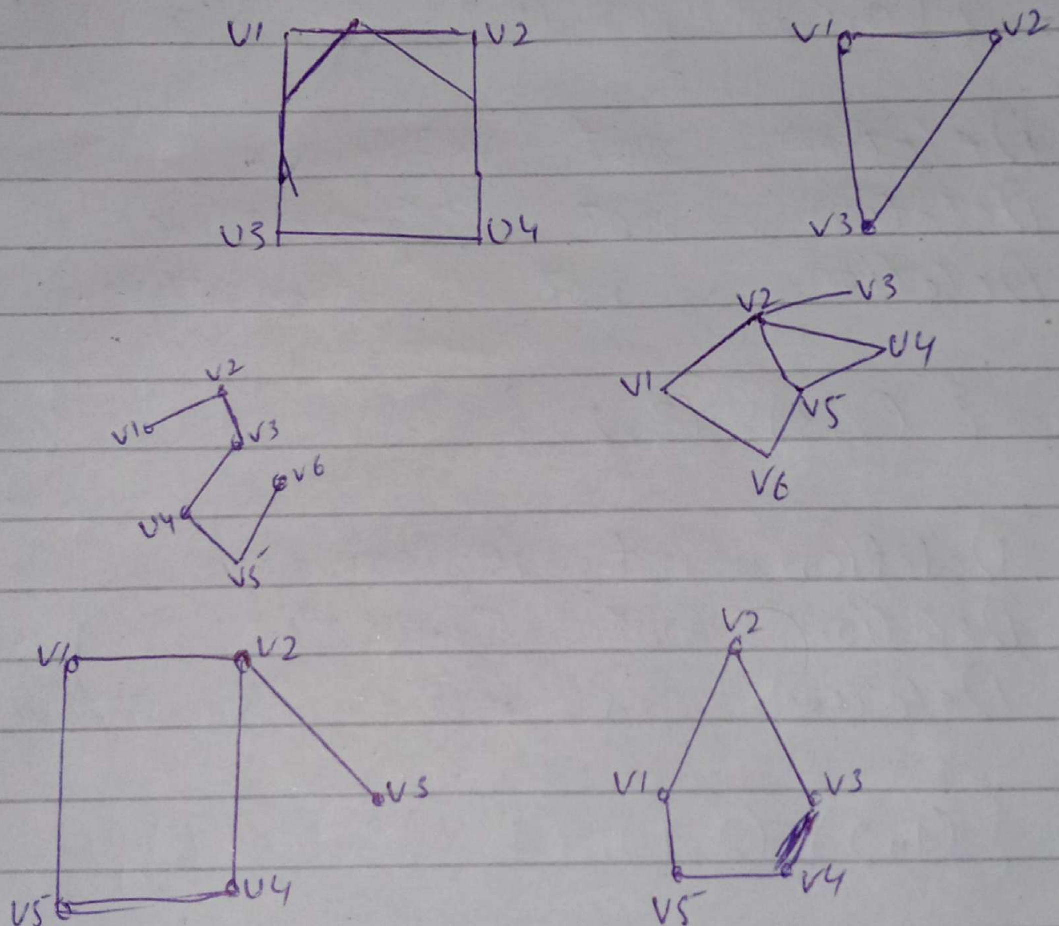
Find which of the following graphs are bipartite Redraw the bipartite nature is evident.

a) Bibartite

b) Bipartite

c) evident

Answer 9.



~~[illegible]~~ Discrete

Q10

In this exercise a graph is used to help Solve a Scheduling Problem Twelve faculty members in a mathematics department Serve on the following Committee. Undergraduate Education; Tenner, Peterson, Kashiwa, Cohen, Catoir, Colloquium: Sahin, Memery, Ash, Library: Cortzen, Tenner, Sahin, Hiring: Gatto, Memery, Yang, Peterson, Personnel: Yang, Wang, Cortzen. The Committees must all meet during the first week of classes, but there are only three time Slots available. Find a Schedule that will allow all faculty members to attend the meetings of all Committees on which they Serve. To do this represented each Committees as the vertex of a graph,

Next. we will assign a Color to each to each vertex Such that no two adjacent vertices have the Same Color (thus no two vertices that are Connected by and edge will have the Same Color.

Colloquium: = Blue.

We then notes then we Colored all vertices Such that no adjacent vertices have the Same Color and we used exactly 3 Colors.

Hiring = Red.

Next, the vertex "library" is the only vertex that is not connected to the vertex "library by an edge and thus we can color library the same as Hiring, let us then color this vertex with Purple.

Graduate Education" = Purple.

Next, We note that vertex "Undergraduate Education" is Connected to vertex, Hiring" and vertex "Personal by an edge. Thus we cannot color the vertex, Personal with Red nor with Blue, let us then color this vertex with Purple.