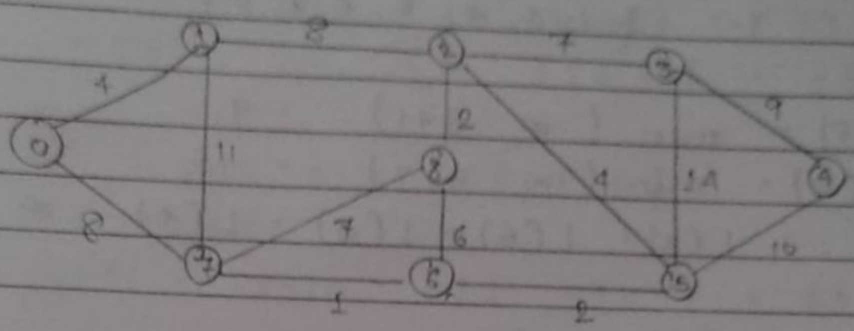
PAGE NO.
DATE :

ASSIGNMENT :- 03

Q1]



(1) $P = \phi$.

$T = \{0, 1, 2, 3, 4, 5, 6, 7, 8\}$

path : $1 \rightarrow 4$.

(2) $P = \{0\}$

$T = \{1, 2, 3, 4, 5, 6, 7, 8\}$

$\therefore L(0) = 0$.

$L(1) = \text{minimum}(\infty, 0 + 4) = 4$

$L(7) = \text{minimum}(\infty, 0 + 8) = 8$

$\therefore L(4) = L(2) = L(3) = L(5) = L(6) = L(8) = \infty$.

(3) $P = \{0, 1\}$

$T = \{2, 3, 4, 5, 6, 7, 8\}$

$\therefore L(1) = 4$.

$\therefore L(7) = \text{minimum}(\infty, 4 + 11) = 15$

$L(2) = \text{minimum}(\infty, 4 + 8) = 12$.

$\therefore L(3) = L(5) = L(6) = L(8) = L(4) = \infty$.

PAGE NO.
DATE :

④ $L(7) = 8$
$P = \{0, 1, 7\}$
$T = \{2, 3, 4, 5, 6, 7, 8\}$

$L(6) = \min(\infty, 8+1) = 9.$
$L(8) = \min(\infty, 8+7) = 15$
$\therefore L(2) = L(5) = L(3) = L(4) = \infty.$

⑤ $L(8) = 15.$
$P = \{0, 1, 7, 8\}$
$T = \{2, 3, 4, 5, 6\}$

$L(6) = \min(9, 15+6) = 9$
$L(2) = \min(12, 15+2) = 12$
$\therefore L(3) = L(5) = L(4) = \infty.$

⑥ $L(6) = 9.$
$P = \{0, 1, 6, 7, 8\}$
$T = \{2, 3, 4, 5\}$
$L(5) = \min(\infty, 9+2) = 11$
$\therefore L(3) = L(4) = \infty.$

⑦ $L(2) = 12.$
$P = \{0, 1, 2, 7, 6, 8\}$
$T = \{3, 4, 5\}.$

$L(5) = \min(11, 12+4) = 11$
$L(3) = \min(\infty, 12+7) = 19$
$\therefore L(4) = \infty.$

⑧ $L(5) = 11.$
$P = \{0, 1, 2, 5, 6, 7, 8\}$

PAGE NO.
DATE :

$T = \{3, 4\}$.

$\therefore L(3) = \min(19, 11+14) = 19$
$L(4) = \min(\infty, 11+10) = 21$.

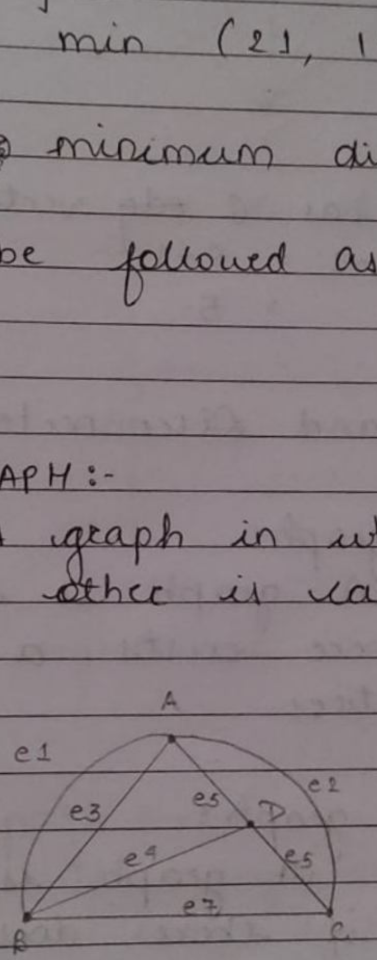
(9) $P = \{0, 1, 2, 3, 5, 6, 7, 8\}$
$T = \{4\}$
$\therefore L(4) = \min(21, 19+9) = 21$

$\therefore$ minimum distance $= 21$.

path will be followed as: $8 \xrightarrow{8} 7 \xrightarrow{1} 6 \xrightarrow{2} 5 \xrightarrow{10} 4$.
$= (8+1+2+10)$
$= 21$.

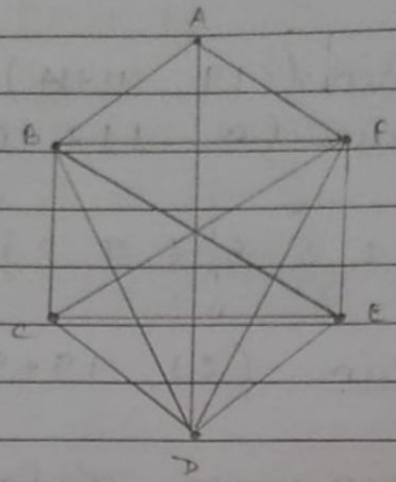
Q2] (1) PLANAR GRAPH:-
A graph in which has no edges crossing each other is called planar graph.

example:



(2) COMPLETE GRAPH:-
A graph in which degree of vertices is (n-1) (where n is number of vertices) or simply a graph where each vertex is connected to each other by edge.

example : K_6



K_6 graph has 6 ~~edg~~ vertices.

$\therefore \quad n-1 = 6-1$

$= 5.$

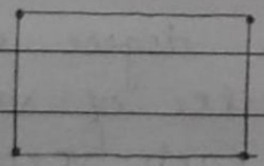
③ Connected and Disconnected graph.

a) Connected graph:-

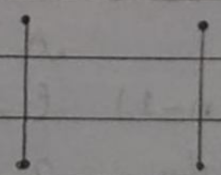
A graph is said to be connected graph if there exists a path between every pair of vertices.

b) Disconnected graph:-

A graph is said to be disconnected if there doesn't exists a ~~pair~~ path between every pair of vertices.

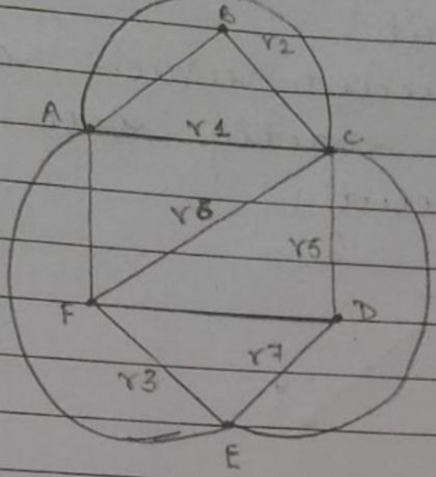


[connected]



[disconnected]

Q3]

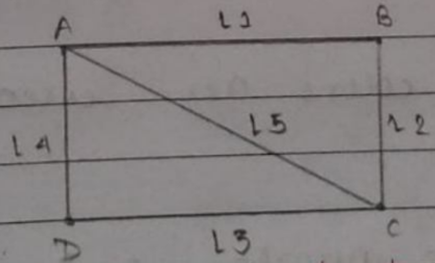


Region name	Bounded vertices
r1	ABC
r2	ABC
r5	CDF
r6	AFC
r3	AEF
r7	FED

The another region in above figure (r8) is infinite.

Q5] a) Eulerian path :-
If every edge in particular path appears only once then that path is called eularian path.

example:-

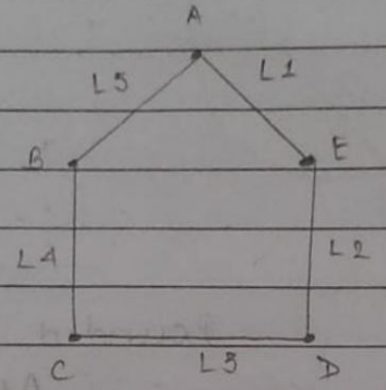


PAGE NO.
DATE :

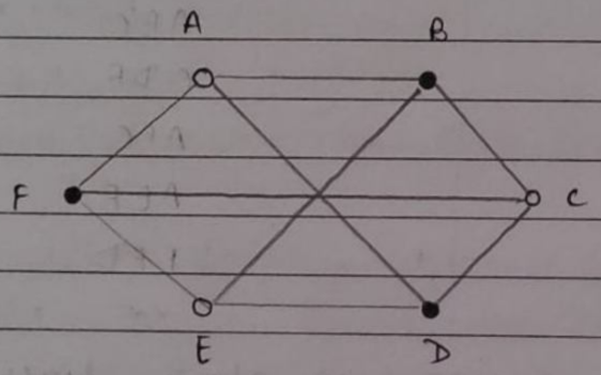
b] Eulerian circuit :-

A circuit which contains every edge of graph exactly once is known as Eulerian circuit.

example:-



Q 4]



Vertex	color
A	white
B	Black
C	white
D	Black
E	white
F	Black.

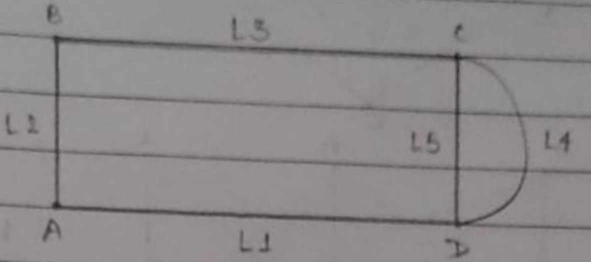
In above 2 colors are used, black and white

∴ chromatic number = 2.

Q6] a) Multigraph:-

A graph which has self loops and or parallel edges is called multigraph.

example:-

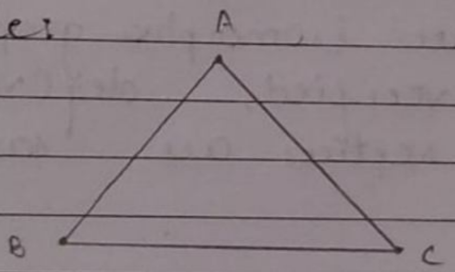


Q7] a) K_n :-

K_n means complete graph, where degree of vertices is $(n-1)$.

n = no. of vertices

example:

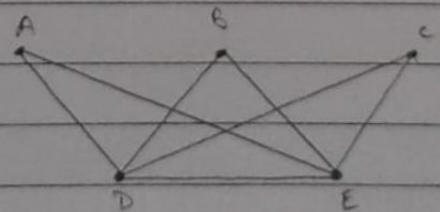


K_3 graph, edges = 3, $\deg(v) = 2$.

b) K_{mn} :-

A complete bipartite graph, in which each vertex is joined to vertices to each other and forms a unique edge.

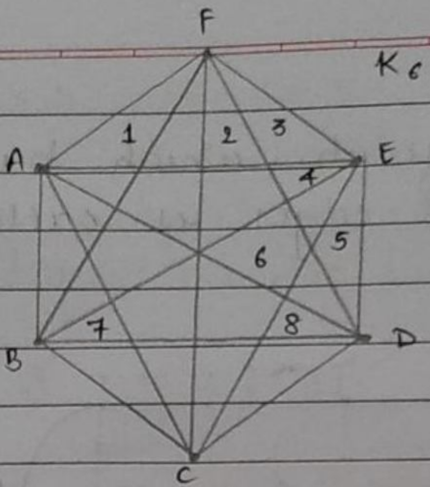
example:



K_{32}

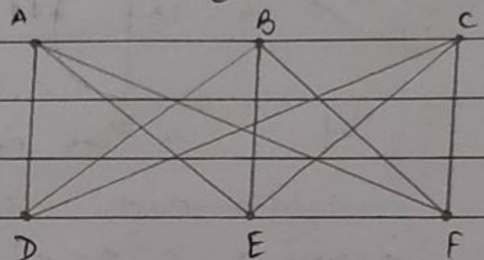
PAGE NO.
DATE :

Q8]



K_6

15 edges.



$K_{3,3}$

Both above figures of K_6 and $K_{3,3}$ have same no. of vertices

Thus having more vertices in K_6 than $K_{3,3}$

∴ They are isomorphic graphs as the adjcency is verified, deg(vertices) is same and no. of vertices are same.

$\frac{9}{10}$ Sna