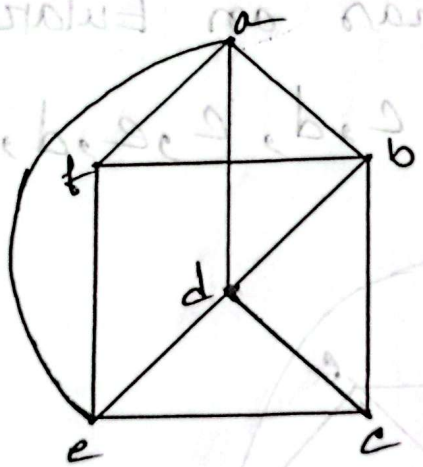
Chapter- 8.5

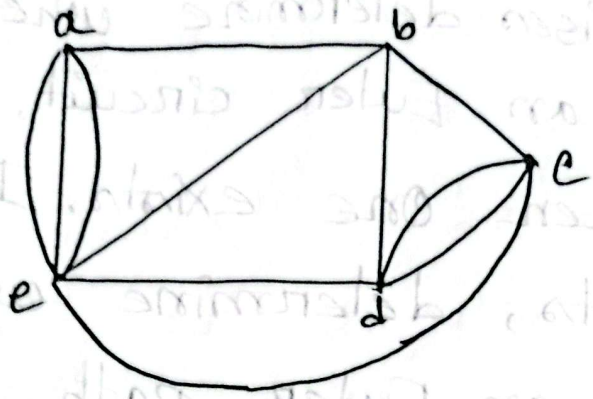
In Exercises determine whether the given graph has an Euler circuit. Construct such a circuit when one exists. If no eular circuit exists, determine whether the graph has an Euler path and construct a path, if one exists.

41



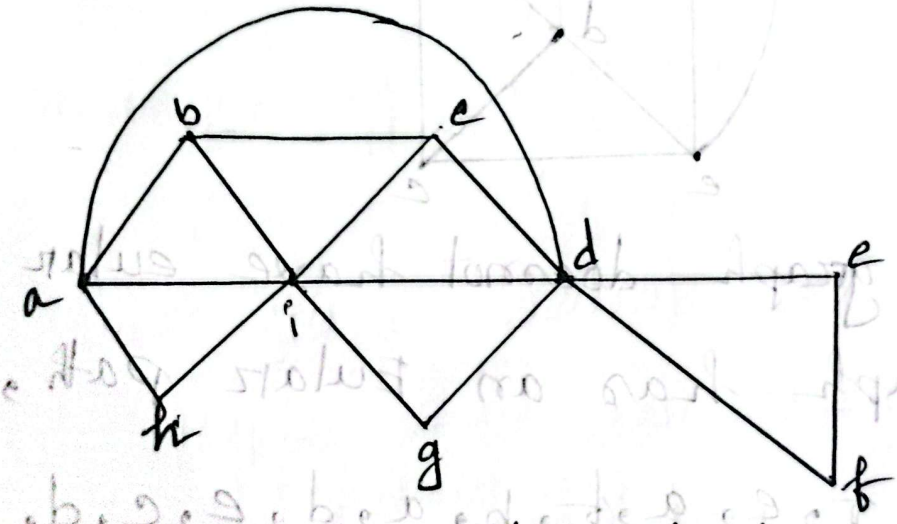
Ans: The graph doesnot have eular circuit. The graph has an Eular path, for example, f, e, a, f, b, a, d, e, c, d, b, c.

(5)



Ans: The graph doesnot have eular circuit. The graph has an Eular path. For example, a, b, c, d, c, e, d, b, e, a, e, a.

(6)



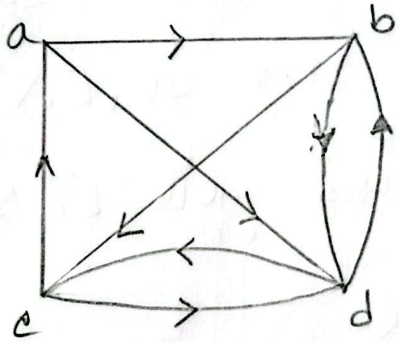
Ans: The graph doesnot have eular circuit. The graph has an Eular path. For example, i, b, a, i, h, a, d, g, e, f, d, g, i, d, c.

For directed graph

In a = 2	In b = 3	In c = 2	In d = 3	} eular circuit
out a = 2	out b = 3	out c = 2	out d = 3	
In a = 2	In b = 1	In c = 3	in~~out~~ d = 2	} Eular path
out a = 1	out b = 2	out c = 2	out d = 3	

In exercises 18-23 determine whether the directed graph shown has an Euler circuit. Construct an Euler circuit if one exists. If no eular circuit exists, determine whether the directed graph has an Eular path. Construct an Eular Path if one exists.

(18)



Ans: The graph doesnot have Euler circuit. The graph has an Euler ~~circ~~path.

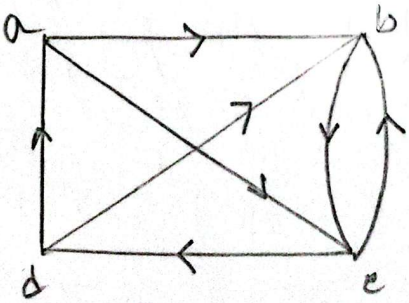
For example, a, b, d, b, c, d, c, a, d.

In a = 2
out a = 1

In b = 3
out b = 1

In c = 2
out c = 2

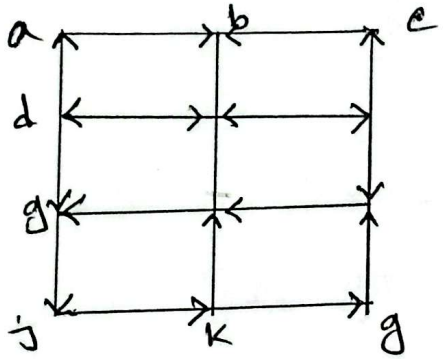
(19)



Ans: The graph doesnot have Euler circu and Euler path. Because Indeg a = 2, out deg a = 1

In $\deg^- b = 3$, $\text{out deg}^+ b = 1$; In $\deg^- c = 2$, $\text{out deg}^+ c = 2$
In $\deg^- d = 1$, $\text{out deg}^- d = 2$. The in-degree and out-degree of the graph are not same. So, there is no eular path. The in-degree and out-degree of each vertex are not same. So, there is no eular circuit.

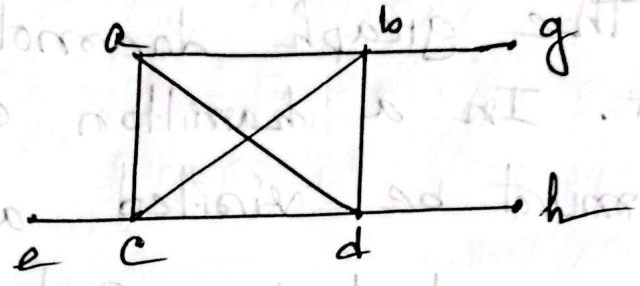
(23)



Ans: The graph has neither a eular circuit nor a euler path. Because in-degree and out-degree of the graph are not same. So, there is no eular path. The in-degree and out-degree of each vertex are not same. So, there is no eular circuit.

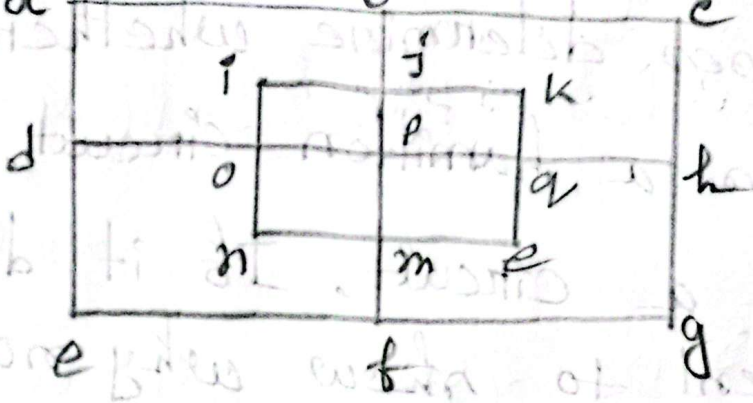
In exercises determine whether the given graph has a hamilton circuit. If it does, find such a circuit. If it doesn't, give an argument to show why no such circuit exists.

(33)



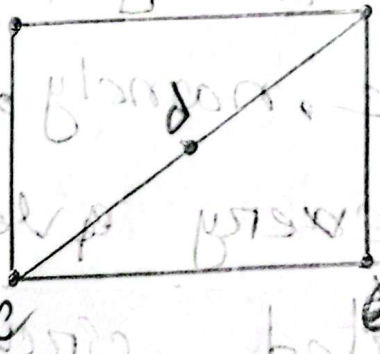
Ans: The graph doesn't have hamilton Circuit. Because the graph has a vertex of degree one, namely, e, g, h. The graph doesn't visit every vertex exactly once. Once a purported circuit has reached e it would have nowhere to go.

(34)

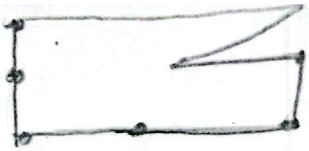


Ans. The graph doesnot have hamil circuit. In a hamilton circuit, every vertex must be visited and no edge can be used twice. But here, vertex o, p, q, j, m are visited twice. So, there is no hamilton circuit.

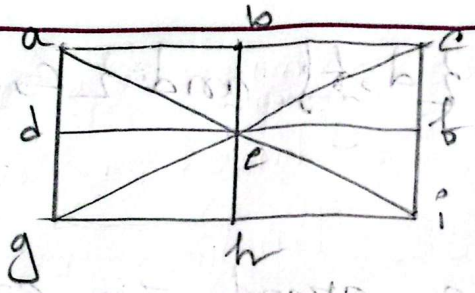
(35)



Ans. NO hamilton circuit exists, because every edge in the graph is incident to a vertex of degree 2 and therefore must be in the circuit.



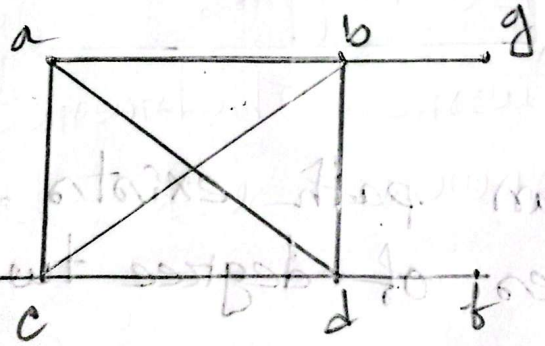
(36)



Ans: The graph has a hamilton circuit, namely, a, d, g, h, i, e, f, c, b, a,

(40) Does the graph in exercises 33 have a hamilton path? If no, find such a path If doesnot give an argument to show why no such path exists.

Ans:

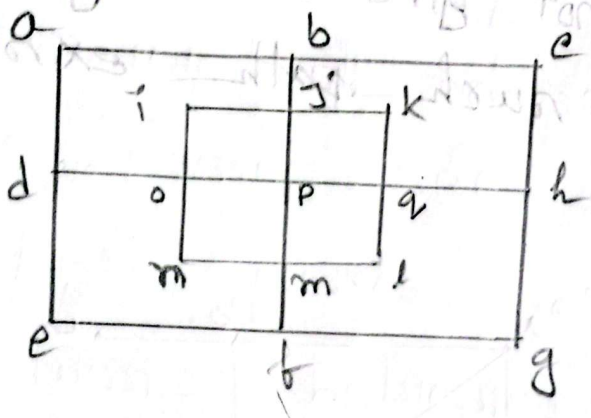


Ans: The graph doesnot have a Hamilton path, because any path containing all vertices must contain one of the

edges $\{b, g\}$, $\{d, f\}$ and $\{c, e\}$ more than once.

(11) Does the graph in exercise 34 have a hamilton path? If so, find a such a path. If it doesnot, give an argument to show why no such path exists.

Ans:

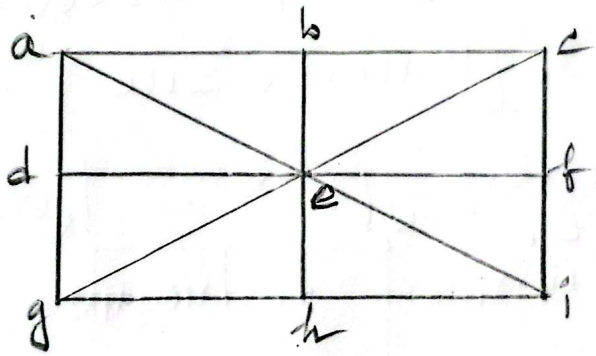


No hamilton path exists. There are eight vertices of degree two and only two of them can be end vertices of a path. For each of the other six, their two incident

edges must be in the path. It is not hard to see that if there is to be a Hamilton path, exactly one of the inside corner vertices must be an end, and that is impossible.

(43) Does the graph in Exercise 35 have a hamilton Path? If so, find such a path. If it doesnot, give an argument to show why no such path exists.

Ans:



The graph has a hamilton path, namely a, b, c, f, i, h, g, d, e.