Date
28/10/21
Thursday

CT2 CS321 Graph Theory

CS19B1015
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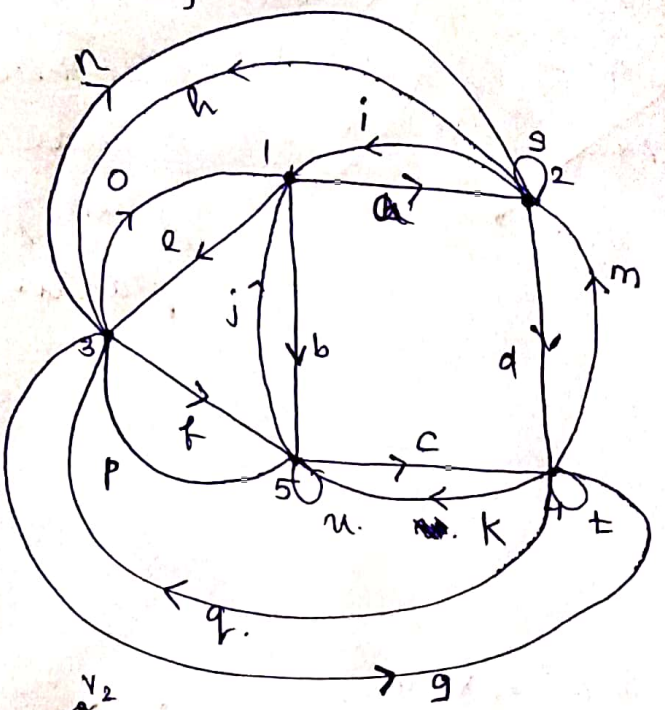
1)

$V = \{1, 2, 3, 4, 5\}$

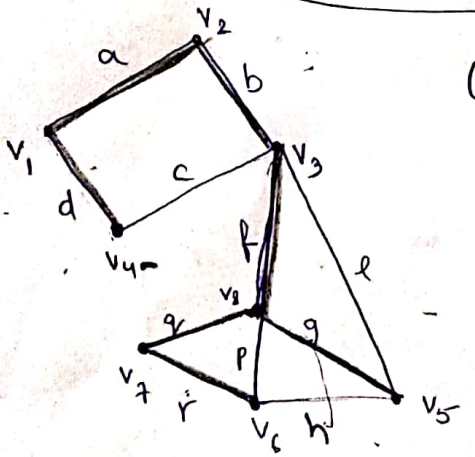
$E = \{a, \ldots\ldots, u\}$

Graph :-



Yes it is planar, as we have found one ~~one~~ structure that is able to be embedded.

2)



(i) Fundamental cut sets :-

$\{cb\}$

$\{cfe\}$

$\{egh\}$

$\{nph\}$

$\{cd\}$

(ii) $\{cb\} \oplus \{cd\} = \{bd\}$ ×

$\{egh\} \oplus \{cf\} = \{hgcf\}$ ✓

$\{nph\} \oplus \{egh\} = \{npge\}$ ✓

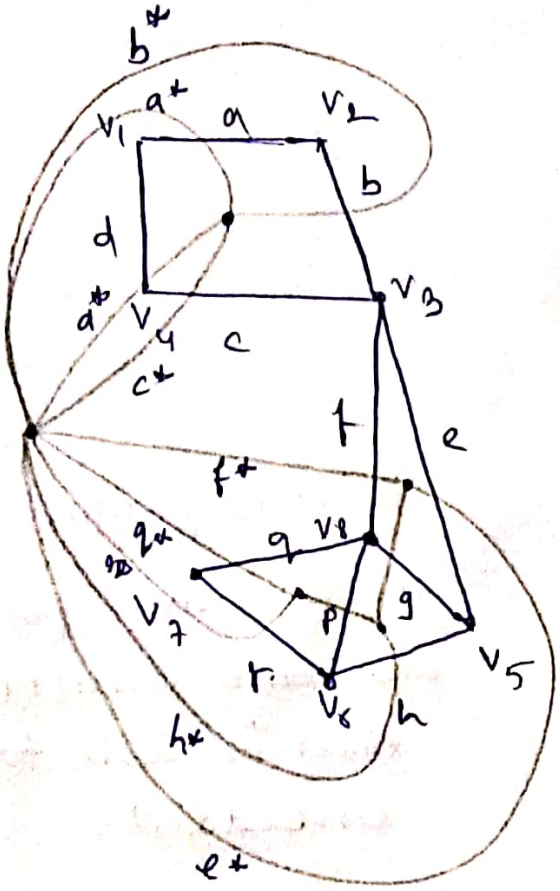
} These two are non fundamental.

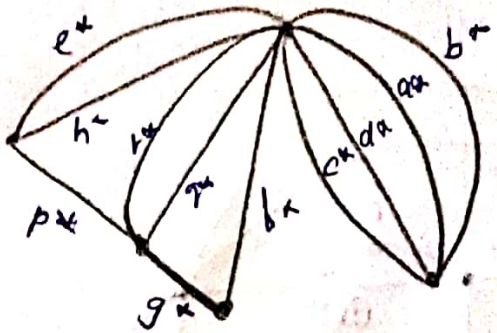
(iii) Vertex connectivity – 1 ← (taking out v_3 which disconnects the graph into two components)

Edge connectivity – 2 ← the minimum degree in the graph is two.

(iv) No., its not non-seperable. There is an edge required between v_4 & v_7 or v_4 & v_8 to make it non-seperable.

(v)





Yes there is a dual ∴ the given graph is planar.

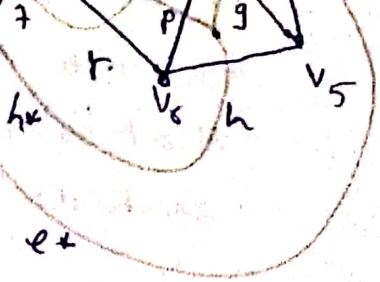
(vi)

r of G = 7

n of G = 4

r of G^* = 4

r of G^* = 7



planar.

(vi)

r of G_1 = 7

u of G_1 = 4

r of G^* = 4

r of G^* = 7

(vii)

	a	b	c	d	e	f	g	h	q	p	r
v_1	1	0	0	1	0	0	0	0	0	0	0
v_2	1	1	0	0	0	0	0	0	0	0	0
v_3	0	1	1	0	1	1	0	0	0	0	0
v_4	0	0	1	1	0	0	0	0	0	0	0
v_5	0	0	0	0	1	0	0	1	0	0	0
v_6	0	0	0	0	0	0	0	1	0	1	1
v_7	0	0	0	0	0	0	0	0	1	0	1
v_8	0	0	0	0	0	1	1	0	1	1	

(ix)