GT A-3

20k-0470
BCS-5E
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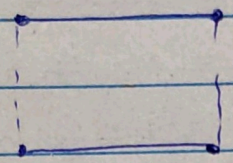
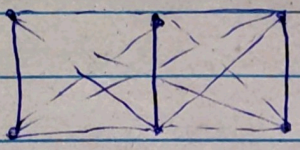
Q1) let $n=2$ $2(n)=4$ vertices



perfect matching
since every vertex is saturated
hence $\delta \geq 2$
$2 \geq 2$ proved.

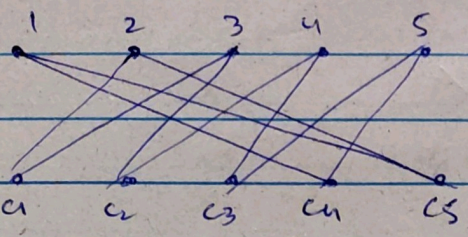
$\delta(G)=2$ $n=2$

let $n=3$ $2(n)=6$ vertices



→ complete graph
← perfect matching $\delta(G)=4$
$4 \geq 3$ ←

(Q2)



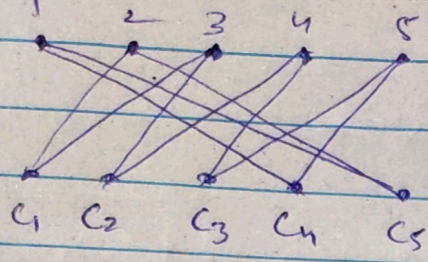
(b) $\deg(1)=2$
" $(2)=2$
" $(3)=2$
" $(4)=2$
" $(5)=2$

(c) $\deg(c_1)=2$
" $(c_2)=2$
" $(c_3)=2$
" $(c_4)=2$
" $(c_5)=2$

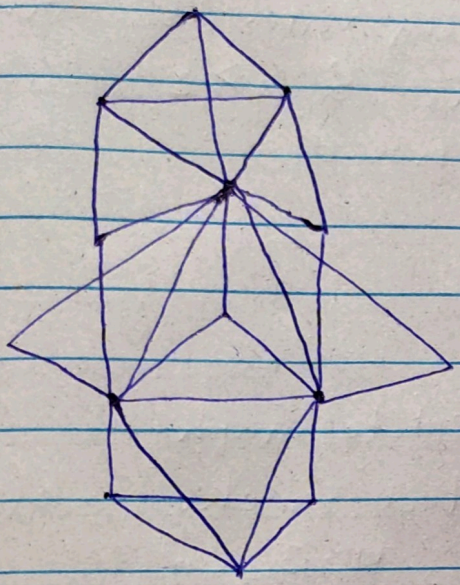
(d) its 2-regular since all vertices have degree 2.

(e) Yes

(f)



(Q4)



→ No perfect matching

(b) 5

(Q4)

U	A	B	C	D	E	F
V	A	B	C	D	E	F
W	A	B	C	D	E	F
X	A	B	C	D	E	F
Y	A	B	C	D	E	F
Z	A	B	C	D	E	F

U	A	B	C	F	E	D
V	A	B	C	F	E	D
W	C	B	D	A	F	E
X	C	A	D	B	E	F
Y	E	D	A	B	F	E
Z	D	E	F	C	B	A

A	Z	X	Y	U	V	W
B	Y	Z	W	X	V	U
C	V	X	W	Y	U	Z
D	W	Y	U	V	Z	V
E	U	V	X	W	Y	Z
F	U	W	X	Y	Z	V

Stable matching

U ↔ F

V ↔ C

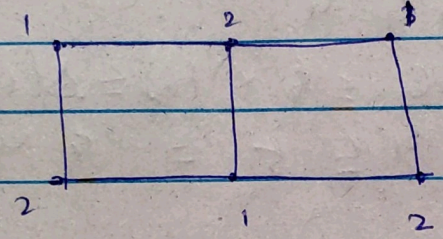
W ↔ B

X ↔ A

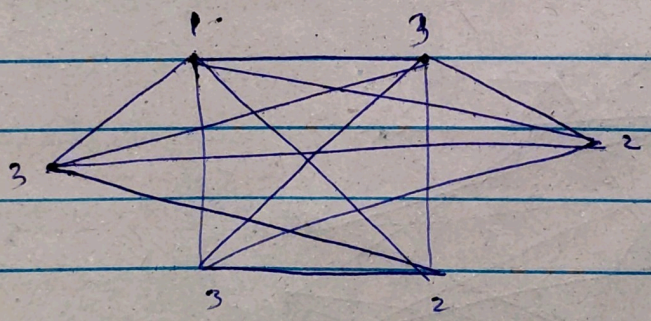
Y ↔ D

Z ↔ E

(Q5)

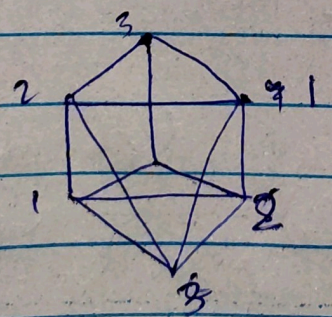


$\chi(G) = 2$

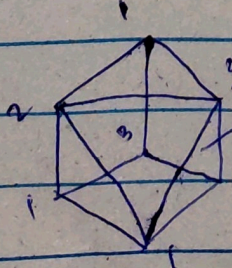


$\chi(G) = 3$

Q(i)

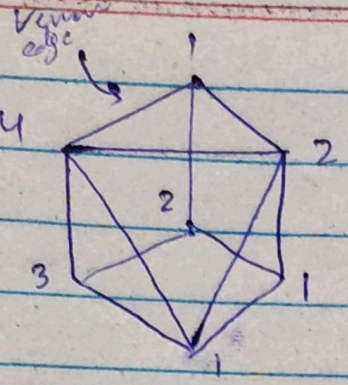


6(ii)



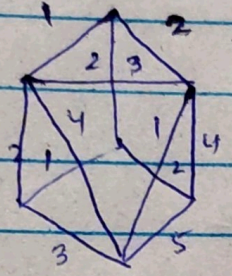
→ dotted

$\chi(G) = 3$



$\chi(G) = 4$

(iii)



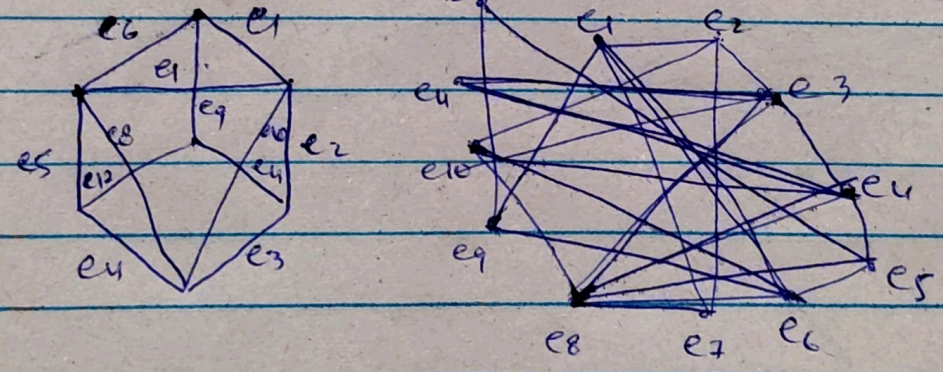
$\chi'(G) = 5$

$\Delta G = 4$

$\Delta G \leq \chi'(G) \leq \Delta(G) + 1$

$4 \leq 5 \leq 4 + 1$ // proved.

(iv)



(v) $\chi(G)$ of graph = 5

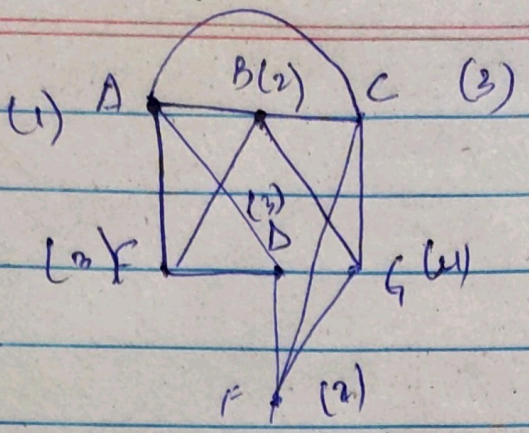
$\chi(G)$ of its graph $= \chi'(G)$

5 = 5 → Proved.

{ Chromatic of Line $G = 5$

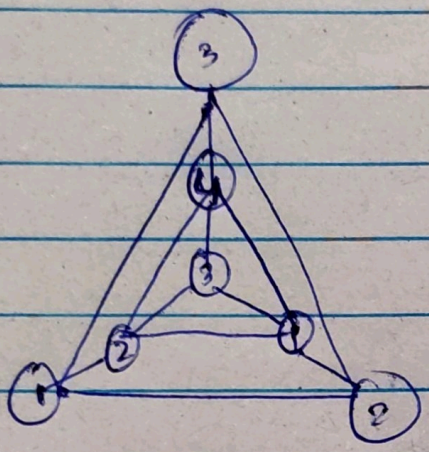
$\chi(L(G)) = \chi'(G)$ }

(Q7)



min 4 time slot will be required since 4 colors

(Q8)



(b)