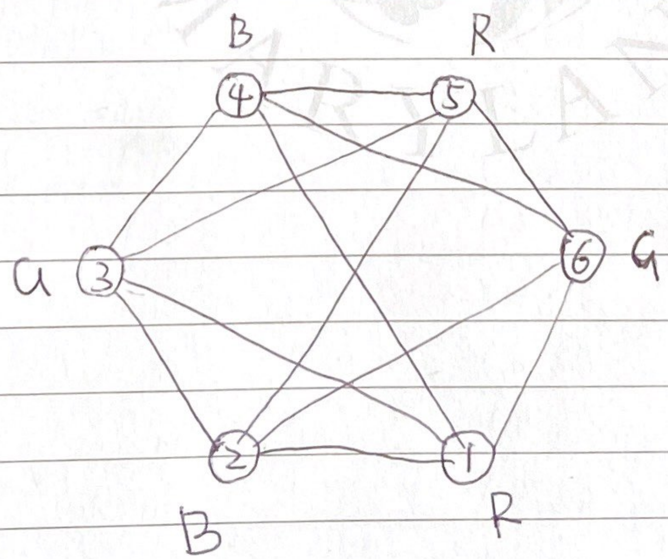
NP 4

(1)(a)

Vertex	1	2	3	4	5	6
Color (R, B, G)	R	B	G	B	R	G

Edge	Color left endpoint	Corlor right endpoint
(1,2)	R	B
(1,3)	R	G
(1,4)	R	B
(1,6)	R	G
(2,3)	B	G
(2,5)	B	R
(2,6)	B	G
(3,4)	G	B
(3,5)	G	R
(4,5)	B	R
(4,6)	B	G
(5,6)	R	G



(b)

1 2 3 4 5 6	Bad edge	Color on endpoints
RBGRRR	(5,6)	R
RBGRRB	(4,5)	R
RBGRRG	(4,5)	R
RBGRBR	(1,6)	R
RBGRBB	(5,6)	B
RBGRBG	(1,4)	R
RBGRGR	(1,4)	R
RBGRGB	(1,4)	R
RBGRGG	(1,4)	R
RBGBRR	(5,6)	R
RBGBRB	(2,6)	B
RBGBRG	(1,5)	R
RBGBBR	(4,5)	B
RBGBBB	(4,5)	B
RBGBBG	(4,5)	B
RBGBGR	(1,6)	R
RBGBGB	(2,6)	B
RBGBGG	(5,6)	G
RBGGRR	(3,4)	G
RBGGRB	(3,4)	G
RBGGRG	(3,4)	G
RBGGBR	(3,4)	G
RBGGBB	(3,4)	G
RBGGBG	(3,4)	G
RBGGGR	(3,4)	G
RBGGGB	(3,4)	G
RBGGGG	(3,4)	G

11 (a) To convince you that the graph is c-colorable, we need go over all edges, each edge has two ~~vertex~~ endpoints. To Check first vertex, we need n-1 times. For second vertex, it takes n-2 times.

$$\frac{(n-1+1)(n-2+1)}{2} = \frac{n^2-n}{2} \quad \text{that's } \Theta(n^2)$$

(b) To convince you that the graph is not c-colorable, we need to consider all edges that contain all possible colors. $c^{(n-c)} \cdot \left(\frac{(n-1+1)(n-2+1)}{2}\right) \quad \Theta(c^{n-c} n^2)$