

## **ASSIGNMENT . 3**

**MUHAMMAD MUJTABA**  
**SP22-BSE-036**

**DISCRETE STRUCTURES**

**MAM MEMOONA MALIK**

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## Question . 1

(a)

1.  $18 \times 325 = 5850$
2.  $18 + 325 = 343$

(b)

- The format of license plates is either **LL DD** or **LL DDD** or **LLL DDD** or **LLL DD**
  - o So we have total **20,077,200** plates possible.
  - o We did this by replacing **L** with 26 and **D** with 10 and summed all of their 4 combinations:  
 $(26 \times 26 \times 10 \times 10 + 26 \times 26 \times 10 \times 10 \times 10 + 26 \times 26 \times 26 \times 10 \times 10 \times 10 + 26 \times 26 \times 26 \times 10 \times 10)$   
 $= 20,077,200$

## Question . 2

- i.  $= n! / r! (n-r)! = 25! / 4! (25-4)! = 12650$
- ii.  $= n! / (n-r)! = 25! / (25-4)! = 303600$

## Question . 3

$$(a + b)^n = nC_0 a^n \cdot b^0 + nC_1 a^{n-1} \cdot b^1 + nC_2 a^{n-2} \cdot b^2 + \dots + nC_n a^{n-n} \cdot b^n$$

$$\text{Here } a = x, b = y, n = 13 \text{ We know, } nC_r = \frac{n!}{r! \cdot (n-r)!}$$

So in our case,  $n = 13$ , currentTerm  $k = 8$  so coefficient will be:  
 $= 13! / (8! \cdot (13-8)!) = 1287$

## Question . 4

Vertex count: 5

Edge count: 8

Degree sequence:  $3, 3, 3, 3, 2 = 3, 3, 3, 3, 2$

Mapping:  $3, 3, 4, 4, 2 = 3, 3, 4, 4, 2$

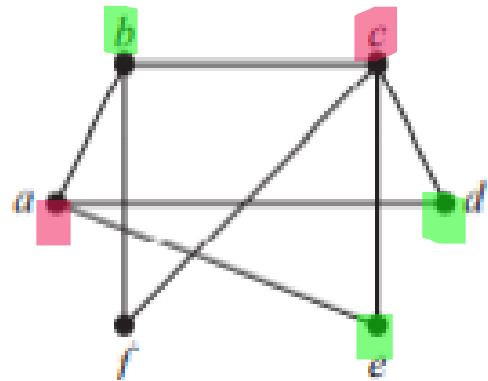
$U_1 = v_1, u_2 = v_5,$

$u_3 = v_2, u_4 = v_3, u_5 = v_4$

this is isomorphic because all above are same.

## Question . 5

this is not a biparte graph because assigning vertex **f** to either of the groups will lead to the corresponding edge still joining to both of the sets.



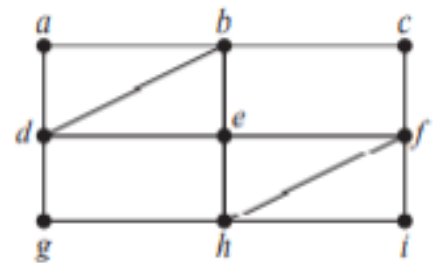
## Question . 6

Yes it exists:

A,b,c,f,e,h,

G,d,e,h,f,e,

B,d,a



## Question . 7

- a. **a**
- b. **e,b,g,d,h,i,o**
- c. **j,k,f,l,m,c,n,q,r,s,p**
- d. null
- e. **d**
- f. **p**
- g. **g,b,a**
- h. **e,f,g,j,k,l,m**

