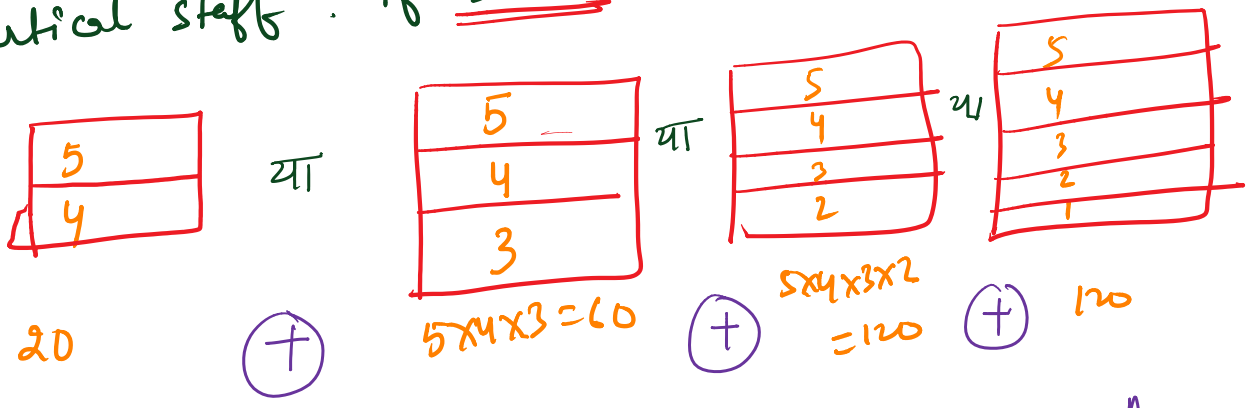
12 September 2021 15:37

12 Sep, 21

Lec2 Permutation and Combination

Q→ Find diff no. flags that can be generated by at least 2 flags in order (one below the other) on a vertical staff. if 5 diff (R, B, G, Y, W) colour are available?

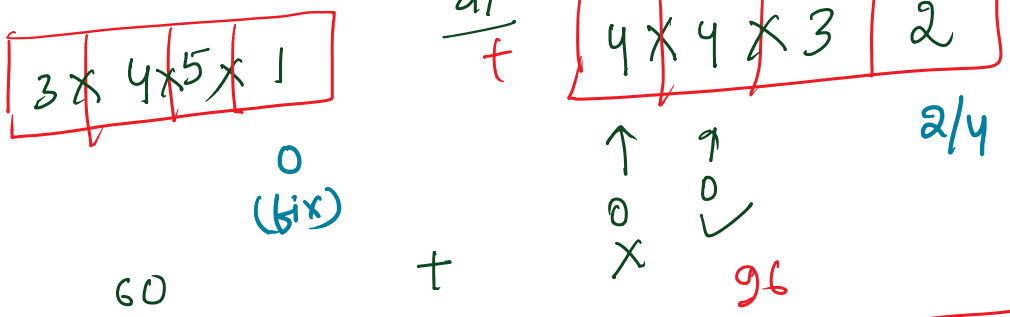


$= 20 + 60 + 120 + 120 = 320$

Q2:→ 4 digit even number. → 0, 1, 2, 3, 4, 5

अलग

① RNA



$\Rightarrow 60 + 96 =$ 156 ways

① RA → 0, 1, 2, 3, 4, 5

$\boxed{5 \times 6 \times 6 \times 1}$ ⊕ $\boxed{5 \times 6 \times 6 \times 2}$

0 ✗ (first box); 0 fix (last); 0 ✗ (first); 2/4 (last)

180 + 360 = **540 ways**

$\boxed{5 \times 6 \times 6 \times 3}$ = **540 ways**

0 ✗ (first); 0, 2, 4 (last)

② 1, 2, 3, 4, 5, 6

3 digit odd no. possible ?

RA: $\boxed{6 \times 6 \times 3}$ = 108 way (last: 1, 3, 5)

RNA: $\boxed{5 \times 4 \times 3}$ = 60 ways (last: 1, 3, 5)

④ 0, 1, 2, 3, 4, 5, 6 how many 5 digits. possible.

RA

(i) greater than 24000 can be made.

(ii) less than 54000

(iii) Between 24000 and 54000.

Sol^n:- (i)

$\boxed{1 \times 1 \times 7 \times 7 \times 7} = 7^3 - 1$ ↳ (24000)

Fix 2, 4

या

$\boxed{1 \times 2 \times 7 \times 7 \times 7} = 2 \cdot 7^3$

Fix 2 5/6

या

4 × 7 × 7 × 7 × 7 = $4 \cdot 7^4$

3/4/5/6

↑

$7^3 - 1 + 2 \cdot 7^3 + 4 \cdot 7^4$ Ans

(b) less than 54000.

1 × 4 × 7 × 7 × 7

↑ ↑

5 0/1/2/3

(fix)

$= 4 \cdot 7^3$

या

4 × 7 × 7 × 7 × 7

↑

1,2,3,4

$+ 4 \cdot 7^4$

$= 4 \cdot 7^3(1+7) = 32 \cdot 7^3$ Ans

(c) Between 24000 and 54000

1 × 1 × 7 × 7 × 7 $= 7^3 - 1$

fix ← 2 4

या

2 × 7 × 7 × 7 × 7

3/4 $= 2 \cdot 7^4$

या

1 × 2 × 7 × 7 × 7 $= 2 \cdot 7^3$

fix 2 5/6

या

1 | 4 × 7 × 7 × 7

5 0/1/2/3 $= 4 \cdot 7^3$

$7^3 - 1 + 2 \cdot 7^3 + 2 \cdot 7^4 + 4 \cdot 7^3$ Ans

$\Rightarrow 7^3(1+2+2\cdot7+4)$

$21\cdot7^3-1$ ✓

(5) How many no $>10,00$ but not greater than 4000 can be made $\rightarrow$ 0, 1, 2, 3, 4

$1000 \le n \le 4000$

(I) RA

(II) RNA.

1 0 0 0

$3 \times 5 \times 5 \times 5 = 3\cdot5^3$ $-1+1 = 3\cdot5^3$

1/2/3

$1 \times 5 \times 5 \times 5$ या $2 \times 5 \times 5 \times 5$

1 fix 2/3

5^3-1 $2\cdot5^3+1$

↳ (excluding 1000) ↳ (including 4000)

$\Rightarrow 5^3 - 1 + 2\cdot5^3 + 1 = 3\cdot5^3$ ✓

(II) RNA $1000 \le n \le 4000$

0, 1, 2, 3, 4

$1 \times 4 \times 3 \times 2$ या $2 \times 4 \times 3 \times 2$

Fix 1 2/3

$\Rightarrow 24 + 48 + 1 = 73$

↳ (including 4000) ✓

(6) 3 digit even no.

condition (5) → (7)

1st next digit

$L \times L \times 5$ 2

5	7	0,2,4,6,8

	5	7

even ✗

⑤ Ans

⑦ 5 T/F → No student [illegible] ✗

→ No 2 student answer sheet same.

① how many students

1 → 2

2 → 2

3 → 2

4 → 2

5 → 2

$2^5 - 1$

$= 31$ Ans

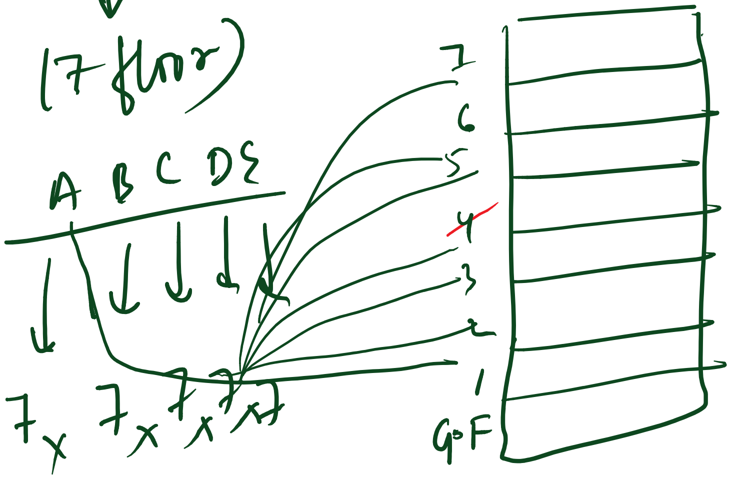
⑧ Lift → ground floor → 5 person

↓

(7 floor)

(i) at any one of the 7 floors

(ii) at different floor.



7^5 Ans

A B C D E

↓ ↓ ↓ ↓ ↓

$7 \times 6 \times 5 \times 4 \times 3$

$= 7 \times 6 \times 5 \times 4 \times 3$ Ans

⑨ By using digits → 0, 1, 2, 3, 4, 5 (RNA)

numbers are formed by using any no. of digits
→ Find total no. of non-zero number that can be formed.

RNA

5	+	5 × 5	+	5 × 5 × 4	+	5 × 5 × 4 × 3	+	5 × 5 × 4 × 3 × 2
0		0 0		0 0 ✓		0		
×		× ✓		×		×		

+ | 5 | 5 | 4 | 3 | 2 | 1 |

$\Rightarrow 5 + 5^2 + 5^2 \cdot 4 + 5^2 \cdot 12 + 5^2 \cdot 24 + 5^2 \cdot 24$

Q → Find 3 digit no. contain only one 7 ?

RNA

8 × 8 × 1	or	8	1	8	or	1 × 9 × 8
7		0	7			7 0
0 ✗ 7 ✗		×				

$64 + 64 + 72 = 200$

(11) Find 3 digit no. containing atleast one 7 ?

atleast = Total − none

atleast one 7 = Total − None 7

RN

Total digit ⇒ | 9 × 10 × 10 | = 900

0 ×

None 7 ⇒ | 8 × 9 × 9 | = 72 × 9 = 648

0 1 1 ×
× × ×

= 900 − 648

none 7 = 900 − 648

= 252