

1) The no of ways you can invite 3 of your friends on 5 consecutive days, exactly one friend a day, such that no friend is invited on more than two days is  
**(A) 90 (B) 60 (C) 30 (D) 10**

**Ans :** Let the five friends be A, B and C.

- ∴ The friends can be invited as :
  - (i) AA BB C
  - (ii) BB CC A
  - (iii) CC AA B

∴ The total number ways = 3

Now each of these selections can be sequenced in  $\frac{5!}{2! \cdot 2!}$  or 30 ways.

∴ The required no of ways =  $3 \times 30 = 90$  **(ans)**

2) Consider 3 boxes, each containing 10 balls labelled 1,2,.....,10. Suppose 1 ball is drawn from each of the boxes, denoted by  $x_i$ , the label of the ball drawn from the i-th box,  $i = 1,2,3$ .

Then the no of ways in which the balls can be chosen such that  $x_1 < x_2 < x_3$ , is

**(A) 120 (B) 130 (C) 150 (D) 160**

- 8 9 10 – 1 way
- 7 8 9 - 10 – 2 ways
- 6 9 10 – 1 way; Total : (1 + 2) ways
- 6 7 8 - 10 – 3 ways
- 5 8 9 - 10 – 2 ways
- 5 9 10 – 1 way; Total : (1 + 2 + 3) ways
- .....
- 1 2 3 - 10 – 8 ways
- .....
- 1 9 10 – 1 way; Total : (1 + 2 + 3 + 4 + 5 + 6 + 7 + 8) ways

∴ Total no of ways =  $(1) + (1 + 2) + (1 + 2 + 3) + (1 + 2 + 3 + 4) + (1 + 2 + 3 + 4 + 5) + (1 + 2 + 3 + 4 + 5 + 6) + (1 + 2 + 3 + 4 + 5 + 6 + 7) + (1 + 2 + 3 + 4 + 5 + 6 + 7 + 8)$  ways  
 =  $1 + 3 + 6 + 10 + 15 + 21 + 28 + 36 = 120$  **(ans)**

3) A closet has 5 pairs of shoes. The no of ways in which 4 shoes can be chosen from it so that there will be no complete pair is

**(A) 80 (B) 160 (C) 200 (D) none of the foregoing nos**

**Ans :** 1 shoe can be selected from a pair of 2 in  ${}^2C_1$  or 2 ways.

∴ 1 shoe each from the 5 pairs can be selected in  $(2)^5$  ways or 32 ways.

Out of these 5 shoes, 4 can be selected in  ${}^5C_4$  or  ${}^5C_1$  or 5 ways.

∴ Total number cases that 4 shoes are selected =  $32 \times 5 = 160$  **(ans)**

