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 $\frac{\lfloor 5}{\lfloor 2 \cdot \lfloor 2}$ or 30 ways.

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

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2) Consider 3 boxes, each containing 10 balls labelled 1,2,.....,10. Suppose 1 ball is drawn from each of the boxes, denoted by , 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 < < , is
(A) 120 (B) 130 (C) 150 (D) 160

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

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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**)

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