A five-digit numbers divisible by 3 is to be formed using the numerals 0, 1, 2, 3, 4 and 5, without repetition. The total number of ways this can be done is *(1989 - 2 Marks)*

(a) 216 (b) 240 (c) 600 (d) 3125

(a) **KEY CONCEPT :** We know that a number is divisible by 3 if the sum of its digits is divisibly by 3.

Now out of 0, 1, 2, 3, 4, 5 if we take 1, 2, 3, 4, 5 or 0, 1, 2, 4, 5 then the 5 digit numbers will be divisible by 3.

Case I : Number of 5 digit numbers formed using the digits 1, 2, 3, 4, 5 = 5! = 120

Case II : Taking 0, 1, 2, 4, 5 if we make 5 digit number then

I place can be filled in = 4 ways (0 can not come at I place)

II place can be filled in = 4 ways

III place can be filled in = 3 ways

IV place can be filled in = 2 ways

V place can be filled in = 1 ways

$\therefore$ Total numbers are = $4 \times 4! = 96$

Thus total numbers divisible by 3 are = 120 + 96 = 216