

## **Answer on Question #51567, Physics, Solid State Physics**

What is the Bravais lattice formed by all lattice points which have the Cartesian coordinates  $(x,y,z)$  such that

- i)  $x, y$  and  $z$  are all even numbers
- ii)  $x, y$  and  $z$  are either all even numbers or all odd numbers.

### **Answer:**

- i) The lattice will be simple cubic with lattice constants  $a=2$ , if  $(x, y, z)$  are all even.
- ii) The lattice will be body-centered cubic with lattice constants  $a=2$ , if  $(x, y, z)$  are all even or all odd. We will get a lattice with  $(x, y, z)$  all odd, and each new lattice point is in the center of the cubic of old lattice, if we shift the lattice in part (i) as  $(x, y, z) \rightarrow (x+1, y+1, z+1)$ . Hence we obtain a body-centered cubic lattice.