If a, b, c are real and $x^3-3b^2x+2c^3$ is divisible by $x-a$ and $x-b$, then

A) $a=-b=-c$

B) $a=2b=2c$

C) $a=b=c$, $a=-2b=-2c$

D) None of these

Correct Answer: C

Solution:

As $f(x)= x^3-3b^2x+2c^3$ is divisible by $x-a$ and $x-b$, therefore
$f(a)=0 \Rightarrow a^3-3b^2a+2c^3=0$ ......(i) and

$f(b)=0 \Rightarrow b3-3b3+2c3=0$ ......(ii)

From (ii), $b=c$

From (i), $a3-3ab2+2b3=0$
(Putting $b=c$)
$\Rightarrow (a-b)\ (a2+ab-2b2)=0$

$\Rightarrow a=b$ or $a2+ab=2b$

Thus $a=b=c$ or $a2+ab=2b2$ and $b=c, a2+ab=2b2$
is satisfied by $a=-2b$.
But $b=c$.
$a2+ab-2b2=0$ and $b=c$ is equivalent to $a=-2b=-2c$