Que 9: If $f(x)=\begin{vmatrix}\cos(2x) & \cos(2x) & \sin(2x)\\ -cosx & cosx & -sinx\\ sinx & sinx & cosx\end{vmatrix}$, then **[JEE(Advanced) 2017]**

$(1) f'(x)=0$ at exactly three points in $(-\pi,\pi)$

$(2) f(x)$ attains its maximum at $x=0$

$(3) f(x)$ attains its minimum at $x=0$

$(4) f'(x)=0$ at more than three points in $(-\pi,\pi)$

Ans 9:

Expansion of determinant

$f(x)=cos2x+cos4x$
$f'(x)=-2sin2x-4sin4x=-2sinx(1+4cos2x)$
That is maxima is at $x=0$

$f'(x)=0\Rightarrow x=\frac{n\pi}{2}, cos2x=-\frac{1}{4}$

$\Rightarrow$ more than two solutions