$$\lim_{x \to 0} \frac{\sin 3x\,(1-\cos 2x)}{e^{x^3}-1}$$

put $x = 0$

$$\frac{0}{1-1} = \frac{0}{0}$$

Apply L-hopital rule

$$\lim_{x \to 0} \frac{3\cos 3x\,(1-\cos 2x) + 2\sin 3x\,(\sin 2x)}{e^{x^3} \cdot 3x^2}$$

put $x = 0$

again $\frac{0}{0}$ form

aply l-hopital rul.

$$\Rightarrow \lim_{x \to 0} \frac{3\left[3\sin 3x\,(1-\cos 2x) + 2\sin 2x\,(\cos 3x)\right] + 2\left[3\cos 3x \cdot \sin 2x + 2\cos 2x \sin 3x\right]}{e^{x^3}\, 3x^2 \cdot 3x^2 + \cancel{3x^2}\, e^{x^3}\, 6x}$$

again $\frac{0}{0}$ form

apply L-hopital rul

$$\lim_{x \to 0} \frac{-9\sin 3x + 9\sin 3x\cos 2x + 6\sin 2x\cos 3x + 6\cos 3x \cdot \sin 2x + 4\cos 2x \cdot \sin 3x}{e^{x^3}\,(9x^4 + 6x)}$$

$$= \frac{-9\sin 3x + 13\sin 3x\cos 2x + 12\sin 2x\cos 3x}{e^{x^3}\,(9x^4 + 6x)}$$

$$\frac{-27\cos 3x + 13\left(3\cos 3x\cos 2x + 2\sin 2x\sin 3x\right) + 12\left(2\cos 2x\cos 3x + 3\sin 3x\sin 2x\right]}{e^{x^3}\cdot 3x^2\left(9x^4+6x\right) + \left(36x^3+6\right)e^{x^3}}$$

put $x = 0$

$$= \frac{-27 + 13\times 3 + 12\times 2}{6} = \frac{-27+24+39}{6}$$

$$= \frac{-3+39}{6} = \frac{36}{6} = \boxed{6}$$