NAME; OIYOJI OGHENEYOMA EMMANUEL.
DEP; COMPUTER ENGINEERING
MATRIC NO; 19/ENG02/053
COURSE; MAT 102.

(1.) $x = 8t^3 \quad y = 4t^3 - 7t \quad z = t + 3.$

(i) Velocity $= \frac{dr}{dt}$

$$r = xi + yj + zk$$
$$r = 8t^3 i + (4t^3 - 7t)j + (t+3)k.$$
$$\frac{dr}{dt} = 24t^2 i + (12t^2 - 7)j + k.$$

(ii) Acceleration $= \frac{d^2r}{dt^2} = 48t\,i + 24t\,j$ //

(2.) $$T = \frac{dr/dt}{\left|\frac{dr}{dt}\right|}$$

$$r = 3t\,i + t^3 j + t^2 k$$
$$\frac{dr}{dt} = 3i + 3t^2 j + 2tk.$$

$$\left|\frac{dr}{dt}\right| = \sqrt{(3)^2 + (3)^2 + (2)^2} = \sqrt{9+9+4}$$

$$\left|\frac{dr}{dt}\right| = \sqrt{22}$$

$$\therefore T = \frac{3i + 3j + 2k}{\sqrt{22}}$$