Solution

1. $$u(t) * u(t) = tu(t)$$

   Use this fact for the following convolution calculations

2. $$u(t-3)*[t^2\delta(t-3)-u(t+2)] = \boxed{9u(t-6)-(t-1)u(t-1)}$$

3. $$y(t) = u(t) * u(t) * (t^2 u(t)) = (tu(t)) * (t^2 u(t))$$
   $$= \left[\int_0^t \tau^2 (t-\tau)\, d\tau\right] u(t)$$
   $$= t\tau^3/3 - \tau^4/4\Big|_{\tau=0}^{t} = t^4/3 - t^4/4 = \boxed{t^4/12u(t)}$$

4. $$u(t) * \delta(7 - t/3) = \boxed{3u(t-21)}$$