1.

$$\int (1 + t^2 + t^4 + t^6)\,dt = x + \frac{t^3}{3} + \frac{t^5}{5} + \frac{t^7}{7} + C$$

$$\int \left(\sqrt{x^3} - 3x^2 + 7e^x - \frac{2}{x} + \frac{5}{x^4} \right) dx$$

$$= \int \left(x^{3/2} - 3x^2 + 7e^x - \frac{2}{x} + 5x^{-4} \right) dx$$

$$= \frac{2}{5}x^{5/2} - \frac{3}{3}x^3 + 7e^x - 2\ln|x| + \frac{5}{-3}x^{-3} + C$$

$$= \frac{2}{5}x^{5/2} - x^3 + 7e^x - 2\ln|x| - \frac{5}{3x^3} + C$$

$$\int \frac{x^2 - 3x + \sqrt{x} - \sqrt[3]{x}}{\sqrt[3]{x^4}}\,dx$$

$$= \int \left(\frac{x^2}{x^{4/3}} - \frac{3x}{x^{4/3}} + \frac{x^{1/2}}{x^{4/3}} - \frac{x^{1/3}}{x^{4/3}} \right) dx$$

$$\int \left(x^{2/3} - 3x^{-1/3} + x^{-5/6} - \frac{1}{x} \right) dx$$

$$= \frac{3}{5}x^{5/3} - 3\cdot\frac{3}{2}x^{2/3} + 6x^{1/6} - \ln|x| + C$$

$$= \frac{3}{5}x^{5/3} - \frac{9}{2}x^{2/3} + 6x^{1/6} - \ln|x| + C$$