**6.** $\dfrac{\partial^2 u}{\partial t^2} = \dfrac{a}{x^n}\dfrac{\partial}{\partial x}\left(x^n \dfrac{\partial u}{\partial x}\right) + uf(x, u^k w^m), \qquad \dfrac{\partial^2 w}{\partial t^2} = \dfrac{b}{x^n}\dfrac{\partial}{\partial x}\left(x^n \dfrac{\partial w}{\partial x}\right) + wg(x, u^k w^m).$

Multiplicative separable solution:

$$u = e^{-m\lambda t} y(x), \quad w = e^{k\lambda t} z(x),$$

where $\lambda$ is an arbitrary constant and the functions $y = y(x)$ and $z = z(x)$ are determined by the system of ordinary differential equations

$$ax^{-n}(x^n y'_x)'_x - m^2\lambda^2 y + yf(x, y^k z^m) = 0,$$
$$bx^{-n}(x^n z'_x)'_x - k^2\lambda^2 z + zg(x, y^k z^m) = 0.$$

 