Binary Option

There are two forms of binary options: *cash-or-nothing* and *asset-or-nothing*. A cash-or-nothing binary option either pays you a fixed amount of money or nothing at all. The asset-or-nothing option is basically the same, but your payment equals the price of the asset underlying the option.
A binary call option pays off the corresponding amount if at maturity the underlying asset price is above the strike price and zero otherwise. The binary put option pays off that amount if the underlying asset price is less than the strike price and zero otherwise.

The price of the option can be found by the formulas below, where Q is the cash payoff, S the initial stock price, X the strike price, T the time to maturity, q the dividend rate, σ the volatility and r the risk free interest rate. N denotes the cumulative distribution function of the normal distribution.

Cash-or-nothing call: $c_{cn} = Qe^{-rT}N(d_2)$

Cash-or-nothing put: $p_{cn} = Qe^{-rT}N(-d_2)$

Asset-or-nothing call: $c_{an} = Se^{-qT}N(d_1)$

Asset-or-nothing put: $p_{an} = Se^{-qT}N(-d_1)$

where

$$d_1 = \frac{\ln(S/X) + (r - q + \sigma^2/2)(T-t)}{\sigma\sqrt{T-t}}$$

and

$$d_2 = d_1 - \sigma\sqrt{T-t}.$$

For further information see J.C. Hull: Options, Futures, And Other Derivatives.