9. (10 points) At age 65, Mrs. Smith retires with \$1,000,000 in her retirement account. Assume that after retirement:

(i) She receives interest of 5% per year (compounded continuously) on the balance in the account, and this money is reinvested in the account ;

(ii) She withdraws money (for living expenses) from the account at a continuous rate of \$60,000 per year.

(a) Write the initial value problem for the balance $B(t)$ of dollars in the account t years after Mrs. Smith retires.

(b) Will Mrs. Smith ever exhaust the retirement account, i.e. reduce the balance in the account to zero? *Explain.*

(c) Are there any equilibrium solutions to the differential equation of part **(a)**? If so, explain their meaning in terms of Mrs. Smith's money.