```
`timescale 10ns/1ps

module testbench;
  reg signed [17:0] s; //input
  reg [3:0] k;  // time period
  reg signed [17:0] InitialOut; // initial condition
  wire signed [17:0] out; // output
  reg clk, reset;
  integer logfile;  // file to store the data


   initial begin

            logfile = $fopen("logfile.txt","w");

         //  if (!logfile)
         //  $display("Can't open \"logfile.txt\"");
         //  $finish;
         //   end

            $timeformat(-9,1,"ns",5);
             InitialOut = 0;
             s = -18'b00001_0000000000000;
            // s = 18'b011111111111111111;
           // s = 18'b000000000000000011;
             k = 9;

    //initial begin
                 clk = 1'b1;
                reset = 0;
          #5 reset = 1;
                forever #1 clk = ~clk;
        //    end

  // initializing the input for the differential equation

   // initial begin



             end

  // stimuli for the differential equation..

  difequ dtest(s,out,InitialOut,k,clk,reset);
  //difequ_integrate dtest(s,out,InitialOut,k,clk,reset);

  // $monitoron; // use this only if monitor is turned off

     always @ (posedge clk)
         #15  begin

           if (reset != 0)

                $fdisplay(logfile,"At t = %t, out = %d",$realtime,out);

            else

                $fclose(logfile);

          end

       always #15000
         begin
            reset = 0;
            $fclose(logfile);
```

```
        end

  endmodule;
```