```
LIBRARY ieee;
USE ieee.std_logic_1164.ALL;

ENTITY function_unit_tb IS
END function_unit_tb;

ARCHITECTURE behavior OF function_unit_tb IS

    -- Component Declaration for the Unit Under Test (UUT)

    COMPONENT function_unit
    PORT(
         A : IN  std_logic_vector(15 downto 0);
         B : IN  std_logic_vector(15 downto 0);
         S : IN  std_logic_vector(4 downto 0);
         F : OUT  std_logic_vector(15 downto 0);
         V : OUT  std_logic;
         C : OUT  std_logic;
         N : OUT  std_logic;
         Z : OUT  std_logic
        );
    END COMPONENT;


   --Inputs
   signal A : std_logic_vector(15 downto 0) := (others => '0');
   signal B : std_logic_vector(15 downto 0) := (others => '0');
   signal S : std_logic_vector(4 downto 0) := (others => '0');

        --Outputs
   signal F : std_logic_vector(15 downto 0);
   signal V : std_logic;
   signal C : std_logic;
   signal N : std_logic;
   signal Z : std_logic;

BEGIN

        -- Instantiate the Unit Under Test (UUT)
   uut: function_unit PORT MAP (
          A => A,
          B => B,
          S => S,
          F => F,
          V => V,
          C => C,
          N => N,
          Z => Z
        );

   -- Stimulus process
   stim_proc: process
   begin
      -- hold reset state for 100 ns.
      wait for 100 ns;
                A <= "1111111111111111";
                B <= "1000111100000000";
                S <= "00000";

                wait for 20 ns;
                S <="00001";

                wait for 20 ns;
                S <="00010";

                wait for 20 ns;
                S <="00011";

                wait for 20 ns;
                S <="00100";

                wait for 20 ns;
                S <="00101";

                wait for 20 ns;
                S <="00110";
```

```
                wait for 20 ns;
                S <="00111";

                wait for 20 ns;
                S <="01000";

                wait for 20 ns;
                S <="01010";

                wait for 20 ns;
                S <="01100";

                wait for 20 ns;
                S <="01110";

                wait for 20 ns;
                S <="10000";

                wait for 20 ns;
                S <="10100";

                wait for 20 ns;
                S <="11000";

      wait;
   end process;

END;
```