**Chapter 3. Basic Concepts**  
  
**3.5 Exercises**  
  
1. Practice writing the following numbers:  
  
a) Decimal number 123 as a sized 8-bit number in binary. Use \_ for readability.  
  
b) A 16-bit hexadecimal unknown number with all x’s.  
  
c) A 4-bit negative 2 in decimal. Write the 2’s complement form for this number.  
  
d) An unsized hex number 1234.  
  
  
a) 123 = 8’b0111\_1011  
  
b) 16’hx  
  
c) -4’d2=4’b1110  
  
d) 32‘h1234  
  
2. Are the following legal strings? If not, write the correct strings.  
  
a) “This is a string displaying the % sign”  
  
b) “out=in1+in2”  
  
c) “Please ring a bell \007”  
  
d) “This is a backslash \ character\n”  
  
  
a) “This is a string displaying the %% sign”  
  
b) right  
  
c) right  
  
d) “This is a backslash \\ character”  
  
3. Are these legal identifiers ?  
  
a) system1  
  
b) 1reg  
  
c) $latch  
  
d) exec$  
  
  
  
a) right  
  
4. Declare the following variables in Verilog:  
  
a) An 8-bit vector net called a\_in.  
  
b) A 32-bit storage register called address. Bit 31 must be the most significant bit. Set the value of the register to a 32-bit decimal number equal to 3.  
  
c) An integer called cout.  
  
d) A time variable called snap\_shot.  
  
e) An array called delays. Array contains 20 elements of the type integer.  
  
f) A memory MEM containing 256 words of 64 bits each.  
  
g) A parameter cache\_size equal to 512.  
  
  
a) wire [7:0] a\_in;  
  
b) reg [31:0] address=32’d3;  
  
c) integer cout;  
  
d) time snap\_shot;  
  
e) integer delays [0:19];  
  
f) reg [63:0] MEM [0:255];  
  
g) parameter cache\_size=512;  
  
5. What would be the output/effect of the following statements ?  
  
a) latch = 4’d12;  
  
$display(“The current value of latch = %b\n”, latch);  
  
b) in\_reg=3’d2;  
  
$monitor($time, “ In register value = %b\n”, in\_reg[2:0]);  
  
c) `define MEM\_SIZE 1024  
  
$display(“ The maximum memory size is %h”, `MEM\_SIZE);  
  
  
a) The current value of latch =4’b1100  
  
b) 0 In register value = 3’b010  
  
c) The maximum memory size is ‘h400