Assignment 5

MCQ:

1. The bit rate of a signal generated from a 8-bit generator is 1600 bps. Calculate the Baud rate of the signal.

A. 400 Baud/sec
B. 12,800 Baud/sec
C. 200 Baud/sec
D. None of the above.

Solution: Option C. 200 Baud/sec
Explanation: Using the relation, bit rate = no. of bits per signal unit * Baud rate;
bit rate = 1600; no. of bits per signal unit = 8. Therefore, Baud rate = 1600/8 = 200 Baud/sec.

2. The return datatype of Serial.parseInt() is

A. char
B. int
C. long
D. double

Solution: Option C. long
Explanation: Fact

3. How many timers(and their bit size) does an Arduino uno chip have?

A. 2 timers: one 8-bit and one 16-bit.
B. 1 timer: 8-bit
C. 3 timers: two 8-bit and one 16-bit
D. 3 timers: one 8-bit and two 16-bit

Solution: Option C. 3 timers: two 8-bit and one 16-bit
Explanation: An Arduino uno has an Atmega328P chip which has a total of 3 timers: two 8-bit and one 16-bit timer.

4. What is the temperature range of an LM35 temperature sensor?

A. -20 to 20 ℃
B. -55 to 150 ℃
C. -40 to 200 ℃
D. None of the above

Solution: Option B. -55 to 150 ℃
Explanation: Fact

5. What are the types of memory found in Arduino uno?

A. Flash, DRAM, EPROM
B. SRAM, PROM
C. Flash, SRAM, EEPROM
D. None of the above.

Solution: Option C. Flash, SRAM, EEPROM

Explanation: Arduino uno has 32KB of Flash memory, 2KB of SRAM, and 1KB of EEPROM.

6. Arduino IDE supports functions from
   A. C
   B. C++
   C. Both A and B
   D. None of the above.

Solution: Option C. Both A and B
Explanation: The Arduino IDE is cross-platform and it supports functions from C and C++ with additional code structuring.

7. Suppose I have two chips, A and B. In chip A, the CPU has predefined addresses for interrupting devices and in chip B, the CPU does not receive the interrupt from the interrupting device, hence the interrupt addresses are unknown. Which chip will have a more efficient CPU, while designing a device to handle interrupts?
   A. Chip A
   B. Chip B
   C. Both have the same efficiency.
   D. Data insufficient for analysis.

Solution: Option A. Chip A
Explanation: Chip A has a vectored interrupt system which reduces CPU clock cycles and increases efficiency than a non-vectored system which is present in chip B.

8. Which storage device uses capacitors?
   A. SRAM
   B. DRAM
   C. EEPROM
   D. None of the above

Solution: Option B. DRAM
Explanation: SRAM has flip flop arrays, EEPROM has floating gate transistors, and DRAM has capacitor-transistor pairs.

9. What is the relation between the power consumption and supply voltage?
   A. Linear
   B. Quadratic
   C. Inverse linear
   D. None of the above

Solution: Option B. Quadratic
Explanation: Power varies linearly with the capacitance, and clock frequency. Power varies directly with the square of the supply voltage.

10. The number of i/o pins in an Arduino uno board is

A. 6
B. 14
C. 5
D. None of the above

Solution: Option B. 14
Explanation: Fact

Short-Answer type(Alphanumeric answers only):

11. The baud rate of an analog signal is 500 and the bit rate is 2000 bps. Calculate the number of signal units.
Solution: 16
Explanation: bit rate = baud rate*no. of bits in each signal unit.
Therefore, no. of bits in each signal unit = 2000/500 = 4; No of signal units = 2^4 =16.

12. What will be the output of the following piece of code:

```
void setup() {
   Serial.begin(9600);
   Serial.print(sizeof(double));
}
```

Solution: 8
Explanation: Arduino uno supports 64-bit precision for double datatype values.