

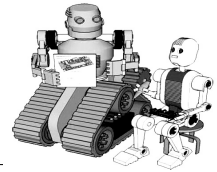
Instructions

Open Book. Open Notes.
Mark your answers on the answer sheet.
Turn in only the answer sheet.

Each CORRECT answer is worth 1 pt
Each BLANK answer is worth 0 pt
Each WRONG answer is worth -1 pt

True and False

1. It is possible to tell exactly what bytes in memory mean without additional information.
2. When you clap your hands other people hear it because the air near your hand travels to the listeners ear.
3. BCD is Binary Carry Decimal.
4. In the PWM article, the duty cycle for the original code is 75%.
5. Writing LATA will always give the same result as setting PORTA.
6. Reading LATA will always give the same result as reading PORTA.
7. Increasing on time increases PWM duty cycle.
8. Increasing off time increases PWM duty cycle.
9. A for loop does not generate any machine code.
10. The machine code generated by the compiler is in the same order as the C code used to generate it.
11. Each line of C code generates one or more machine instructions.

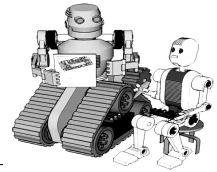


Best Choice Matching

Regarding the MPLAB IDE

- 12. View variables defined in current procedure
- 13. View variables with a global scope
- 14. View output from processor pins
- 15. View machine code generated by compiler.
- 16. View output from compiler and other tools.

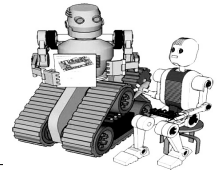
- A) Watch Window
- B) Output Window
- C) Logic Analyzer Window
- D) Disassembly Listing Window
- E) Locals Window



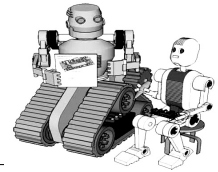
Multiple Choice

On any question you may answer E for none of the above.

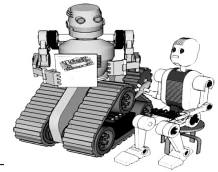
17. We use the binary number system with computers because.
- A) It has fewer digits to work with
 - B) Each digit has two possible values, as does computer memory
 - C) It is easily converted to hexadecimal
18. We use the hexadecimal number system with computers because.
- A) It is easier for people to read than binary
 - B) It is a holdover from hexadecimal based calculators
 - C) We do not use it
19. We use the base 5 number system with computers because.
- A) It is easier for people to read than binary
 - B) It is a holdover from hexadecimal based calculators
 - C) We do not use it
20. Which of the following operators will take the 1's compliment of a number.
- A) % B) - C) ~ D) !
21. Which of the following regarding frequency and period are true.
- A) $f = 1 * p$
 - B) $f = L * p$
 - C) $f = (1/p)$
 - D) $f = (f/p)$
22. Sound is a form of
- A) frequency
 - B) energy
 - C) noise



23. The waves created by a speaker in air are known as.
A) delta waves C) thermal waves
B) expansion waves D) plasma bursts
24. Which of the following did we use to determine the duration of a sound?
A) duration = cycles * period
B) duration = cycles * halfPeriod
C) duration = cycles * frequency
D) duration = cycles * halfFrequency
25. To increase the duration of a tone without changing the pitch.
A) Increase the delay between switching the port bit from on to off
B) Decrease the delay between switching the port bit from on to off
C) Increase the number of cycles
D) Increase the halfPeriod
26. To decrease the frequency of a tone.
A) Increase the period
B) Decrease the period
C) Increase the number of cycles
D) Decrease the number of cycles
27. The delay between turning the port on and off is.
A) The period
B) One half the period
C) The frequency
D) One half the frequency
28. Give that cycles range from 1 to 1000 which is the smallest data byte that will work.
A) unsigned char
B) unsigned int
C) unsigned long
29. There are ____ bits in a byte.
A) 1 B) 4 C) 8 D) 16
30. There are ____ bits in a nibble.
A) 1 B) 4 C) 8 D) 16

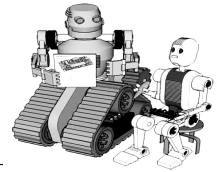


31. The character # tells the compiler.
A) This is the start of a message to be passed to the compiler
B) This is the start of chip configuration
C) Include the following file
32. #pragma config
A) Tells the compiler how to configure the chip
B) Tells the compiler how to configure data
C) Tells the compiler what chip is used
33. #include <filename>
A) Includes a file from the [c:\mcc18](#) directory
B) Includes a file from your project directory
34. #include "filename"
A) Includes a file from the [c:\mcc18](#) directory
B) Includes a file from your project directory
35. With PWM what is the duty cycle?
A) The time the signal is high in seconds.
B) The percentage of time the signal is low during each cycle
C) The percentage of time the signal is high during each cycle
36. Scheduled tests are indicated by what color post-it note on the calendar?
A) Green
B) Yellow
C) Pink (or red)
D) Brown
37. Page 1 of the handout on PWM, the code listing sets TRISA=0x00.
What value would you set TRISA to if you only wanted to change the LED.
A) 0x00 B) 0x01 C) 0x02 D) 0x10
38. The LA in "LA tool" is short for.
A) LA freeway C) Logic Analyzer
B) Log Analyzer D) Logic Adapter



39. The Y axis of the LA tool is
A) Time in seconds
B) Time in micro seconds
C) Time as processor cycles
40. The X axis of the LA tool is
A) Logic state at the processor pin, high or low
B) The actual volts shown at the processor pin
41. The code that executes prior to any code we write sets up the data needed by our program. The name of that that code is.
A) Init
B) C018
C) Preamble
42. Nop() generates this machine code?
A) 0xFFFF
B) 0x0000
C) 0x0020
43. Which of the following is not part of a for or while loop.
A) INIT
B) GOTO
C) ITERATOR
D) TEST
44. for (x=a; x<b; x++)
Variable x ranges from
A) a to b
B) b to a
C) a to b-1
D) a to b+1
45. for (x=b; x>0; x--)
Variable x ranges from
A) b to a
B) a to b
C) b to 1
D) b to 0

Hint: If a and b confuse you
replace them with actual
values.



46. Human hearing is limited to frequencies between about

- A) 20Hz and 20,000 Hz
- B) 200Hz and 200,000 Hz
- C) 200Hz and 20,000 Hz

Note: Hz or hertz is the same as cycles per second.

47. If you do can not see the build icon in MPLAB it is because you opened a.

- A) Project
- B) Workspace
- C) File

48. With 3 signals/pins you can charlieplex.

- A) 2 LEDs C) 6 LEDs
- B) 4 LEDs D) 8 LEDs

49. With charlieplexing you can illuminate how many LEDs at once.

- A) 1 LED
- B) 2 LEDs
- C) 3 LEDs
- D) 4 LEDs

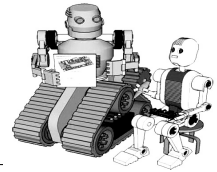
50. #define is used to do

- A) variable declaration
- B) complex variables
- C) text substitution

51. #define X 123

What type is X

- A) char
- B) unsigned char
- C) text
- D) we do not know



From JPUG 1: Multiplexing Charlieplexed Displays

52. LED_MASK

- A) 1's in mask indicate bits used to activate charlieplexed LEDs
- B) 0's in mask indicate bits used to activate charlieplexed LEDs

53. The function setLatA () makes sure that we only change the bits used to control the charlieplexed LEDs.

- A) True B) False

54. Function lightLEDs(int first). The variable onCount indicates how far to count over to find the first led to light.

- A) True B) False

Short Answer (approximately 35 to 50 words)

55. What does each for loop do in function main() ? (Write answer on answer sheet!)