Quiz 01 *Version 01* *Duration: 30 minutes*

Student Name: ----------

Student ID: ----------

Student Tutorial: ----------

Part 1: MSQ Questions (20 marks): *highest 20/25 correct answers will be considered*

- You have to answer by coloring the bubble otherwise the question will **NOT** be marked
- In case of **Otherwise**, you have to fill the dots with the correct answer.

Best of Luck 😊

#	Questions	Answers			
		a	**b**	**c**	**d**
1	The car braking system (ABS) is considered a ……. real-time embedded system. **a)** Soft **b)** Firm **c)** Hard **d)** Weakly-hard	○	○	○	○
2	An embedded system is general-purpose computers embedded into enclosing products and must interact with the physical environment **a)** True **b)** False **c)** **d)**	○	○	○	○
3	PMU is an integrated circuit that is responsible for power handling the problem of undervoltage problem only. **a)** True **b)** False **c)** **d)**	○	○	○	○
4	The real-time embedded systems are subjected to several constraints except for ……. **a)** Power capabilities **b)** Memory Size **c)** No User Interface **d)** All of the Above	○	○	○	○
5	For both µControllers and µProcessor, the memory is considered an essential part of the its internal architecture. **a)** True **b)** False **c)** **d)**	○	○	○	○

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6 In all types of processors types, the CPU must exist

a) True **b)** False **c)** **d)**

7

```
Struct Ta {
      Char  Ta_name [15];
      Short int  office_number ;
}
      Struct Ta x;
```

What is the size in bytes of x?

a) 15 **b)** 19 **c)** 17 **d)** **Otherwise** ……

8

```
void edit ( int * a){
     a = a+1 ;
}
int main( void) {
     int x  = 5  ;
     edit(&x) ;
     printf( " the value of 'x' after edit  is %d  " , x) ;
}
```

Choose the correct printed value.

a) 5 **b)** 6 **c)** 0x00000012 **d)** 0x00000016

9 Given that the first **arr[0]** address is **0x00000000** , what will be the printed statement:

```
void edit_array ( int * a){
     a = a+2 ;   // HINT : a is a local pointer carrying the
     address of arr ( the array name )
     *(a) = (*a)+5 ;
     printf( " address is  %p  " , a) ;
}
int main( void) {
     int arr[] = {1,2,3,4} ;
     edit_array(arr) ;
     }
```

a) address is 0 **b)** address is 0x00000003 **c)** address is 0x00000004 **d)** **Otherwise** …… 0x00000008

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10 Based on question 9, choose the correct values if the array **arr** is printed after calling **edit_array**

a)	b)	c)	d)
{1,2,3,4}	{1,2,8,9}	{9,8,2,1}	**Otherwise** 1,2,8,4

11 Choose the printed output:

```
void multiply ( int m){
    m = m*5  ;
    printf( "  'm' is  is %d  " , m) ;
}
int main( void) {
    int x = 1 ;
    multiply(x) ;
    printf("  x is %d"  , x) ;
}
```

a)	b)	c)	d)
m is 5, x is 5	m is 5, x is 0	m is 1, x is 1	**Otherwise** m=5 x=1

12 Choose the printed output:

```
void add ( int*t){      //this is supposedly an error
    *t = *t + 5  ;
    printf( "  't' is  is %d  ",*t) ;
}
int main( void) {
    int x = 1 ;
    add(&x) ;
    printf("  x is %d"  , x) ;
}
```

but if it was edited to this

't' is 6
x is 6

a)	b)	c)	d)
t is 6, x is 6	t is 1, x is 1	t is 6, x is 1	**Otherwise** ……

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13 Given that **&x is 0x00000004** , **&ptr_1 is 0x00000008**, **&ptr_2 is 0x00000012,** and **&ptr_3 is 0x00000016**

```
int main( void) {
    int x = 16 ;
    int *ptr_1 = &x ;
    int **ptr_2 = &ptr_1 ;
    int * ptr_3 = ptr_1 ;
    printf(" value is %d"  , **ptr_2) ;
    printf( " ptr_3 is  %p", ptr_3 )  ;
    printf(" ptr_1 is %p" , ptr_1) ;
}
```

a) value is 4, ptr_3 is 0x00000016, ptr_1 is 0x00000004	**b)** value is 16, ptr_3 is 0x00000004, ptr_1 is 0x00000008	**c)** value is 16, ptr_3 is 0x00000004, ptr_1 is 0x00000004	**d)** **Otherwise** ……

14 **From Figure 1 in page 6,** this shows which type of processors

a) FPGA	**b)** ASIC	**c)** µController	**d)** µProcessor

15 From Figure 1, the architecture of this processor is following …… Architecture

a) Harvard	**b)** Von Neumann	**c)** Not Clear	**d)**

16 From Figure 1, the shown processor instruction set type is ……

a) CISC	**b)** RISC	**c)** EPIC	**d)**

17 From Figure 1, the processor is capable of optimizing the power.

a) True	**b)** False	**c)**	**d)**

18 From Figure 1, the core of the processor is component (….)

a) (e)	**b)** (f)	**c)** (g)	**d)** (h)

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19	From Figure 1, component (….) is considered part of the memory that can be erased by the user at any time				○	○	○	○
	a) (h)	**b)** (i)	**c)** (j)	**d)** (k)				
20	From Figure 1, the interface with the physical environment is done through component (….)				○	○	○	○
	a) (a)	**b)** (b)	**c)** (e)	**d)** (l)				

Given that the temperature being measured is actually **(25)** $° C$.
Given that the sensor provides a group of readings as follows: **[25.2,24.8,25.3,24.9,25.1]** $° C$.

21	The average of these readings is …….. $\bar{X} = \frac{1}{N}\sum_{n=1}^{N} X_n$				○	○	○	○
	a) 24.3	**b)** 25.2	**c)** 24.76	**d)** **Otherwise** 25.06				
22	For sample 5: the measurement error is …… $\varepsilon_n = X_{n,\,ideal} - X_{n,\,actual}$				○	○	○	○
	a) 0.2	**b)** 0.02	**c)** 0.4	**d)** **Otherwise** -0.1				
23	For sample 5: the accuracy is …… $Acc_n = 1 - \left\lvert \frac{X_{n,\,ideal} - X_{n,\,actual}}{X_{n,ideal}} \right\rvert$				○	○	○	○
	a) 99%	**b)** 97.2%	**c)** 100%	**d)** **Otherwise** 99.6				
24	For sample 5: the precision is …….. $Prec_n = 1 - \left\lvert \frac{X_{n,\,actual} - \bar{X}}{\bar{X}} \right\rvert$				○	○	○	○
	a) 99%	**b)** 97.2%	**c)** 100%	**d)** **Otherwise** 99.7				
25	These readings indicate that our sensor is characterized by ……				○	○	○	○
	a) High accuracy, High precision	**b)** High accuracy, Low precision	**c)** Low accuracy, High precision	**d)** Low accuracy, Low precision				

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Figure 1: Refer to for questions 14-20: