Alexandria University
Faculty of Engineering
Electrical Engineering Department
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جامعة الإسكندرية
كلية الهندسة
قسم الهندسة الكهربية
ابريل 2022

**Introduction to Digital Logic Design and Programming EEC-141**
**First year Electrical Engineering**
**Time allowed: 1 hour (for both part)**

**منخل الدوائر المنطقية و البرمجة**
**السنة الدراسية : السنة الاولى**
**مدة الإمتحان : 1 ساعة (للجزئين)**

## Mid Term Exam

**Choose the MOST APPROPRIATE answer for the following questions.**

**You may choose E (=ALL) If all answers (A, B, C and D) are correct or choose F (=NONE) if none of the answers fits.**

**Please write your answers on the ANSWER SHEET ONLY**

**In the designated answer sheet, mark your choice (Ⓐ, Ⓑ, Ⓒ, Ⓓ, Ⓔ, or Ⓕ) in front of the question number.**

**Be sure that you have filled the appropriate bubbles carefully as in the example below.**

**Example: if the choice for question 300 is "C" then your answer sheet should look like this:**

**300.** Ⓐ Ⓑ ● Ⓓ Ⓔ Ⓕ

**Attempt ALL the following questions**

### PART I: Programming (30 points for 30 questions – 30minutes)

1. For the following segment of code:

```
void main () {char* str1="abcd";char str2[]="abcd";
              printf("%d %d %d",sizeof(str1),sizeof(str2),sizeof("abcd"))}
```

a)2 5 5 b) 2 4 4 c) 8 5 5 d) 2 4 5

2. What will be the output of the following C code?

```
#include <stdio.h>
void main()
{char *a[10]={"hi","hello","how"};int i=0;for (i=0;i<10;i++) printf("%s",*(a[i]));}
```

[a] segmentation fault
b) hi hello how followed by 7 null values
c) 10 null values
d) depends on compiler

3. Is the NULL pointer the same as an uninitialised pointer?
a) True [b] False c) True under condition d) Not Applicable

4. The output of the following program is .....

```
Void main (){char* str1;str1="Hello" printf("%c",*&*p);}
```

a) Hello b) H c) some address will be printed [d] syntax error

5. What will be the output of the following code snippet?

```
#include <stdio.h>
void solve() {int a=3;int res = a++ + ++a + a++ + ++a;printf("%d", res);}
int main() {solve(); return 0;}
```

a) 12 b)24 [c)20] d)18

6. If p is an integer pointer with a value 1000, then what will the value of p + 5 be?
a) 1020 b) 1005 c) 1004 d) 1010

7. Which keyword is used to come out of a loop only for that iteration?

a) break b) continue c) return d) (a) or (b)

8. What will be the output of the following C code?

```
#include <stdio.h>
int main() {int a=10,b=5,c=5;int d;d = a == (b + c);printf("%d", d);}
```

a) Syntax error b) 1 c) 10 d) 5

9. What will be the output of the following program?

```
void test(int *pr) {int x=100;pr=&x;}
int main() {int num=200;int *pr=&num;test(pr);printf("%d",*pr); return 0;}
```

a) 100 b) 200 c) Compiler error d) Runtime Error

10. In the following program add a statement in the function fn() such that address of a gets stored in j?

```
#include<stdio.h>
void fn(int**);
int main() {int *j;fn(&j);return 0;}
void fn(int **k) {int a=10;/* Add a statement here */}
```

a) **k=a; b) k=&a; c) *k=&a d) &k=*a

11. What will be the output of the program?

```
int main()
{int arr[]={10,20,30,40,50,60};int *ptr1=arr;int *ptr2=arr+5;
 printf("%d,",(ptr2-ptr1));printf("%d",(char*)ptr2-(char*)ptr1);return 0;}
```

a) 5,20 b) 20,5 c) 5,5 d) 20,20

12. What will be the output of the program?

```
int main()
{int arr[]={1,2,3,4,5};int *p=arr;++*p;p+=2;printf("%d",*p);return 0;}
```

a) 2 b) 3 c) 4 d) 5

13. What is the output of the program?

```
#include <stdio.h>
int main()
{float c=5.0;printf ("Temperature in Fahrenheit is %.2f",(9/5)*c+32);return 0;}
```

a) Temperature in Fahrenheit is 41.00
c) Temperature in Fahrenheit is 0.00
b) Temperature in Fahrenheit is 37.00
d) Compiler Error

14. What is the output of the program?

```
#include<stdio.h>
int main()
{int i;int sum=1;for(i=1;i<=5;i++);{sum=sum*i;}printf("%d",sum);return 0;}
```

a) compiler error b) 120 c) 24 d) 6

15. What the output of the program?

```
#include<stdio.h>
int main()
{for (int i=0;i<10;i++) {
   switch(i){case 0:i+=3;case 1:i+=2;case 5:i+=3;default:i+=2;break;}
   printf("%d  ",i);}return 0;}
```

a) 10 b) 3 6 9 c) 5 10 d) compiler error

16. What is the output of the program?

```
#include<stdio.h>
int main() {int X=40;{int X=20;printf("%d ",X);}printf("%d\n",X);return 0;}
```

a) 40 40 b) 20 40 c) 20 20 d) compiler Error

17. For the following program,

```
#include <stdio.h>
int main(){int x=10000;double y=56;int *p=&x;double *q=&y;
          printf("p and q are %d and %d",sizeof(p),sizeof(q));return 0;}
```

a) p and q are 4 and 4 b) p and q are 4 and 8 c) compiler error d) p and q are 2 and 8

18. For the following program, assume that swap(&x, &y) exchanges the contents of x and y, what is the output?

```
int main()
{int array[]={3,5,1,4,6,2};int done=0;int i;
 while (done==0){done=1;
   for (i=0;i<=4;i++){if (array[i]<array[i+1]){swap(&array[i],&array[i+1]);done=0;}}
   for (i=5;i>=1;i--){if (array[i]>array[i-1]){swap(&array[i],&array[i-1]);done=0;}}}
   printf("%d",array[3]);}
```

a. 1 b. 2 c. 3 d. 4 **f**

19. How many times will hello be printed in the following program?

```
#include <stdio.h>
int main() {int i=512;for (;i;i >>=1)printf("hello \n");return 0;}
```

a. 0 b. infinity **c. 10** d. 11

**For the next two questions, consider the following code.**

```
#include <stdio.h>
int main()
{int *ptr;int x;ptr=&x;
 *ptr=0;printf(" x = %dn",x);printf(" *ptr = %dn",*ptr);
 *ptr+=5;printf(" x  = %dn",x);printf(" *ptr = %dn",*ptr);
 (*ptr)++;printf(" x = %dn",x);printf(" *ptr = %dn",*ptr);return 0;}
```

20. The fist printed value for x and *ptr is .....

**a. 0,0** b. 1,1 c. random, random d. random , 0

21. The third printed value for x and *ptr is .....

a. 5,5 **b. 6,6** c. 0, random d. random, 0

**For the next <u>TWO</u> questions, consider the following code.**

```
include <stdio.h>
int main()
{FILE* p;int c;int n=0;p=fopen("myfile.txt","r");
 if (p==NULL) perror("Error opening file");
 else {do{c=getc(p);if (c=='$')n++;} while (c!=EOF);fclose(p);printf("%d\n",n);}
 return 0;}
```

22. What is the above program supposed to do?

a. Count of '$' symbol b. Look for '$' symbol c. Open and close file d. (a) and (b) **e**

23. What is the result of executing the above program?

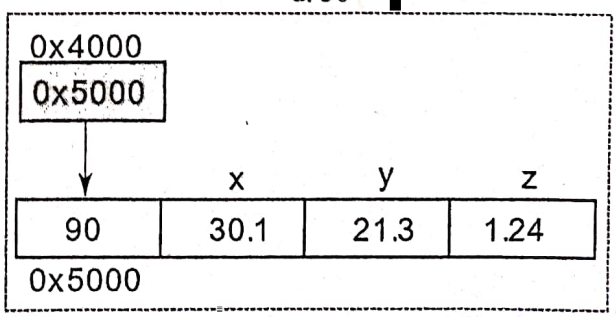
a. Count of '$' symbol b. Error opening file **c. Compile error** d. Run time error

24. What is the output of the following program?

```
#define square(x) x*x
int main() {int x;x=36/square(6);printf("%d",x);return 0;}
```

a. 0 b. 1 c. 6 d. 36 **f**

**A programmer is trying to create a memory-based hack for an offline First-Person-Shooter (FPS) game on a 32-bit Windows architecture. Using a cheat engine. he successfully found a static pointer to the health address. He also deduced that the player x, y, and z coordinates are the subsequent memory addresses as depicted in the figure. With the knowledge that the coordinates are stored as double while the health is stored as an integer and assuming that an integer is 4 bytes in size**



**while a double is 8 bytes in size, solve the following THREE questions, if the health dynamic address is 0x5000.**

25. What will be the x-coordinate dynamic address in case of the memory map of the figure?

a. 0x5001 b. 0x5004 c. 0x5008 d. 0x5016

26. What will be the y-coordinate dynamic address in case of the memory map of the figure?

a. 0x5001 b. 0x5004 c. 0x5008 d. 0x5016

f

27. Is the code below valid for reading the player x-coordinate?

```
int *p=(int*)0x4000;double x_coord=*(double*)(p+4);
```

a. Yes b. No c. Yes, with slight modification d. Not Applicable

28. What will be the result of the following code snippet?

```
#include <stdio.h>
void solve() {char ch[10]="abcdefghij";int ans=0;
              for(int i=0;i<10;i++) {ans+=(ch[i]-'a');}printf("%d",ans);}
int main() {solve();return 0;}
```

a) 45 b) 36 c) 20 d) 100

29. What will be the output of the following code snippet?

```
#include <stdio.h>
void solve() {int x=2;printf("%d",(x<<1)+(x>>1));}
int main() {solve();return 0;}
```

a) 5 b) 4 c) 3 d) 2

30. How to find the length of an array in C?

a) sizeof(a) b) sizeof(a)/sizeof(a[0]) c) sizeof(a[0]) d) sizeof(a)*sizeof(a[])