Topic 1: C programming - Dynamic memory

1. Which of the following statements is a correct declaration of a pointer?

      A) ptr c;

      B) int p;

      C) int *p;

      D) prt &c;

2. We have declared the variable int p; which of the following statements returns the address of p?

      A) &p

      B) *p

      C) **p

      D) None of the above

3. What is the result of executing the following code:

```
int Data=0;

int * ptrData;

ptrData=&Data;

printf ("%p, %d\n", &Data, Data);

printf ("%p, %d\n", ptrData, *ptrData);
```


4. What will be the value of `(*q)` after executing this code?

```
int x = 10;

int *p = &x;

int *q = p;
```

      A) Nothing, code is incorrect

      B) 10

      C) The address of p

      D) None of the above

5. What is the value of x after executing this code?

```
float x = 1.2;

int *p = &x;

*p = *p + 0.8;
```

A) 2.0

B) 1.2

C) Nothing, this code is incorrect

And in this case?

```
float x = 1.2;

Float *p = &x;

*p = *p + 0.8;
```

A) 2.0

B) 1.2

C) Nothing, this code is incorrect

6. What is the value of (*p + 1) after executing this code?

```
float x = 1.2;

float *p = &x;

x = *p + 0.8;
```

A) 2.0

B) 2.2

C) 3

7. What is the value of (x) after executing this code? What is the value of (p)?

```
float x = 1.2;

float *p = &x;
```

```
*p = x + 0.8;
```

8. If we have the following code

```
int x = 10;

int y = 3;

int *p, *q;

p = &y;

q = &x;

*p = *q - 1;

x = x - *p - y;
```

Which is the final value of x?

A) 13

B) -8

C) -3

D) 3

9. What is the value of x at the end of this code?

```
float x = 1.2;

float *p = &x;

float *q = NULL;

*p = x + 0.8;

 p = q;
```

A) 2.0

B) NULL

C) 1.2

D) Nothing, this code is incorrect

10. Which lines are incorrect?

```
int c, *pc;

pc = c;

*pc = &c;

pc = &c;

*pc = c;
```

11. In this code, what is `pt`?

```
Punt p;
Punt *pt;
pt = &p;
pt->X = 9;
```

A) The address of the structure p

B) 9

C) Nothing, it's not a valid expression

12. Which line from this code contains an error?

```
1 Punt p;
2 Punt *pt;
3 pt = &p;
4 (*pt)->X = 9;
```

A) 2

B) 3

C) 4

D) There is no error

13. Which of the following statements allows us to allocate memory for 10 elements of type float:

A) (float)malloc (10)

B) (float *)malloc (10)

C) (float *)malloc (10*sizeof(float))

D) (float *)malloc (10*sizeof(float*))

14. What is the result of executing this code? What is missing?

```
int *ptr; int i:

ptr = (int *)malloc (10*sizeof(int));

for (i=0; i<10; i++)

    *(ptr+i)=i;
```

15. Give the value of the left-hand side variable in each assignment statement. Assume the lines are executed sequentially.

```
int main()
{
   int blocks[3] = {1,2,3};
   int *ptr = &blocks[0];
   int temp;

   temp = blocks[0];
   temp = *(blocks + 2);
   temp = *(ptr + 1);
   temp = *ptr;

   ptr = blocks + 1;
   temp = *ptr;
   temp = *(ptr + 1);


   ptr = blocks;
   return 0;
}
```

16. Which lines from this code contain an error?

```c
int *ip;

ip = (int *)malloc (sizeof(int)*10);

ip[6] = 42;

ip[10] = 99;

*(ip+4) = 4;

ip+4 = 4;
```