

Subject: Programming in C

Topic: Arrays and Pointers – 1

DPP-01

[MSQ]

1. Which of the following declarations are INVALID?

- (a) `int b[][4];`
- (b) `int b[];`
- (c) `int b[2][][2]={1,2,3,4};`
- (d) `int b[][2][2]={1,2,3,4};`

[MCQ]

2. Consider the following two statements:

P: `int a[3]={1, 2, 3};`

`printf("%d", *a++);`

Q: `int a[3]={1, 2, 3};`

`int *p=a;`

`printf("%d", *p++);`

Which of the following statements is/are CORRECT?

- (a) P only.
- (b) Q only.
- (c) Both P and Q.
- (d) Neither P nor Q.

[MCQ]

3. Consider the following program:

```
#include<stdio.h>
int main(void)
{
    int a[5]={5, 10, 15};
    printf("%d", 1[a]);
    return 0;
}
```

The output is-

- (a) 5
- (b) 10
- (c) Garbage value
- (d) Compilation error

[MCQ]

4. Consider the following program:

```
#include<stdio.h>
int main(void)
{
    int 5[a]={5, 10, 15};
```

```
printf("%d", 1[a]);
return 0;
```

```
}
```

The output is-

- (a) 5
- (b) 10
- (c) Garbage value
- (d) Compilation error

[MCQ]

5. Consider the following program:

```
#include<stdio.h>
int main(void) {
    int a[5]={5, 10, 15, 20, 25};
    printf("%u", a);
    printf("%u", *(a+3));
    printf("%u", a+2);
    printf("%u", *(a+2)+6);
    printf("%u", *(a+*(a+1)-6));
    return 0;
}
```

Assuming the base address of the array to be 1000 and integer size as two bytes the output is-

- (a) 1000 20 1004 21 25
- (b) 5 20 15 21 25
- (c) 1000 20 1002 21 24
- (d) Compilation error

[MCQ]

6. Consider the following program:

```
#include<stdio.h>
int main(void)
{
    int a[5]={5, 10, 15, 20, 25};
    printf("%u\t", *(1+a));
    printf("%u\t", &a+1);
    return 0;
}
```

Assuming the base address of the array to be 1000 and integer size as four bytes the output is-

- (a) 1004 1020
- (b) 10 1016
- (c) 10 1020
- (d) 1004 1016

Answer Key

1. (a, b, c)
2. (b)
3. (b)
4. (d)

5. (a)
6. (c)



Hints and solutions

1. (a, b, c)

- (a) `int b[][4]`: Invalid as elements are not specified.
 (b) `int b[]`: Invalid as size is not specified.
 (c) `int b[2][2]={1,2,3,4}`; Invalid. If the elements are specified, only first dimension can be omitted.
 (d) `int b[][2][2]={1,2,3,4}`; Valid. If the elements are specified, only first dimension can be omitted.

2. (b)

`int a[3]={1, 2, 3}`;

Array name without subscript denotes the base address of the array. So, `a++` is not allowed.

Hence, P is incorrect.

Q is correct.

3. (b)

The `printf()` statement can be interpreted as-

`printf("%d", 1[a])` is equivalent to `printf("%d", *(1+a))`;

1000	1002	1004
5	10	15

So, `*(1+a)` is equivalent to `*(1+1000)`. Here, 1 signifies the increment by $1*2$ bytes = 2 bytes.

So, `*(1002)` is 10.

4. (d)

`int 5[a]={5, 10, 15}`; // It is an invalid declaration.

So, compilation error will happen.

5. (a)

1000	1002	1004	1006	1008
5	10	15	20	25

`printf("%u", a);`//1000

`printf("%u", *(a+3));`// $*(1000+2*3)$ i.e *1006 i.e 20

`printf("%u", a+2);`// $1000+2*2=1004$

`printf("%u", *(a+2)+6);`// $*(1000+2*2)+6$ i.e *1004+6 i.e 15+6 i.e 21

`printf("%u", *(a+*(a+1)-6));`

// $*(a+*(1000+2*1)-6) = *(a+4) = *(1000+2*4) = *1008$ i.e 25

Output: 1000 20 1004 21 25

6. (c)

1000	1004	1008	1012	1016
5	10	15	20	25

`printf("%u\t", *(1+a));`// $*(1*4+1000)=*1004=10$

`&a+1` signifies the next 1D array. So, size

incrementing by 1 means increase by $4*5$ bytes.

`printf("%u\t", &a+1);`// $1000+20=1020$ is printed.

Output: 10 1020



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