

Subject: Programming in C

Topic: Arrays and Pointers – 3

DPP-03

[NAT]

1. Consider the following program:

```
#include<stdio.h>
int main()
{
    int p=10, *q;
    q=&p;
    *q=p+++*q;
    printf("%d", *q);
    return 0;
}
```

The output is _____.

[MCQ]

2. Consider the following program:

```
#include<stdio.h>
int * f(){
    static int a[4]={ 1, 2, 3, 4};
    return a;
}

int main()
{
    int *p, i;
    p=f();
    for(i=0;i<3;i++){
        printf("%d\t", p[i]+p[i+1]);
    }
    return 0;
}
```

The output is-

- (a) Compilation Error
- (b) Runtime Error
- (c) 3 5 7
- (d) None

[NAT]

3. Consider the following program:

```
#include<stdio.h>
int main()
{
    int p=10, s=20, *q, **r;
    q=&p;
    *q=p+++*q;
    q=&s;
    r=&q;
    **r=--*q***r;
    printf("%d", p+s);
    return 0;
}
```

The output is _____.

[MCQ]

4. Consider the following program:

```
#include<stdio.h>
int * f()
{
    int a[4]={ 1, 2, 3, 4};
    return a;
}

int main()
{
    int *p, i;
    p=f();
    for(i=0;i<3;i++){
        printf("%d\t", p[i]+p[i+1]);
    }
    return 0;
}
```

The output is-

- (a) compilation Error
- (b) Runtime Error
- (c) 3 5 7
- (d) None

[MCQ]

5. Consider the following statements:

P: `int * p(int *)` - `p` is a function that takes an integer pointer as argument and returns an integer pointer.

Q: `int (*p(int *))[]` - `p` is a function that takes an integer pointer as argument and returns a pointer to an array of integers.

Which of the following is INCORRECT?

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

[MCQ]

6. Consider the following program:

```
#include<stdio.h>
void f(int (*q)[2]){
    printf("%d\t",(*q)[1]);
    q+=2;
    printf("%d",(*q)[1]);
}
int main()
{
    int a[][2]={2,4,6,8,10,12};
    int (*ptr)[2]=a;
    f(ptr);
    return 0;
}
```

The output is:

- (a) 4 12 (b) 4 8
(c) 2 10 (d) 2 6

[MCQ]

7. Consider the following program:

```
#include<stdio.h>
int main()
{
    int a[3]={0,1,2};
    int *p=(int *)&a+1;
    printf("%d\t%d", *(a+1),*(p-1));
    return 0;
}
```

The output is-

- (a) Garbage value
(b) Segmentation fault
(c) 1 2
(d) Compilation Error

[MCQ]

8. Consider the following program:

```
#include<stdio.h>
void fun(int n){
    for(n--;;--n;--n)
        printf("GATE WALLAH");
}
int main()
{
    void (*p)(int)=fun;
    (*p)(6);
    return 0;
}
```

The output is-

- (a) Compilation Error
(b) Runtime Error
(c) `printf()` is executed infinite number of times.
(d) `print()` is executed two times.

Answer Key

- | | |
|----------|--------|
| 1. (21) | 6. (a) |
| 2. (c) | 7. (c) |
| 3. (382) | 8. (d) |
| 4. (b) | |
| 5. (d) | |



Hints and solutions

1. (21)

| | | | | |
|---------------|--|---------------|----|----|
| | 1000 | | | |
| p | <table><tr><td>10</td><td>20</td><td>21</td></tr></table> | 10 | 20 | 21 |
| 10 | 20 | 21 | | |
| | 2000 | | | |
| q | <table><tr><td>1000</td></tr></table> | 1000 | | |
| 1000 | | | | |

*q=p+++*q;=10+*1000=10+10=20;
p is then incremented by 1.

Final value at p=21

2. (c)

No error, since it returns the address of static array.

for(i=0;i<3;i++) printf("%d\t", p[i]+p[i+1]);

The loop prints p[0]+p[0+1], p[1]+p[1+1],
p[2]+p[2+1].

Output: 3 5 7

3. (382)

| | | | | | | | | | |
|-----------------|--|-----------------|------|----|---------------------------------------|---|---------------|----|-----|
| | 1000 | | 3000 | | | | | | |
| p | <table><tr><td>10</td><td>20</td><td>21</td></tr></table> | 10 | 20 | 21 | s | <table><tr><td>20</td><td>19</td><td>361</td></tr></table> | 20 | 19 | 361 |
| 10 | 20 | 21 | | | | | | | |
| 20 | 19 | 361 | | | | | | | |
| | 2000 | | 4000 | | | | | | |
| q | <table><tr><td>1000</td><td>3000</td></tr></table> | 1000 | 3000 | r | <table><tr><td>2000</td></tr></table> | 2000 | | | |
| 1000 | 3000 | | | | | | | | |
| 2000 | | | | | | | | | |

p+s = 21 + 361 = 382

4. (b)

Runtime error exists since it returns the address of local array variable.

5. (d)

Both the statements P and Q are CORRECT.

P: CORRECT.

int *p(int *) - p is a function that takes an integer pointer as argument and returns an integer pointer.

Q: CORRECT

int (*p(int *))[] - p is a function that takes an integer pointer as argument and returns a pointer to an array of integers.

6. (a)

```
void f(int (*q)[2]){
    printf("%d\t",(*q)[1]);//It prints the first element of
    the 0th row of a. So, 4 is printed.
    q+=2;//q now points to the 2nd row of a.
    printf("%d",(*q)[1]);// It prints the first element of the
    2nd row of a. So, 12 is printed.
}
```

Output: 4 12

7. (c)

Suppose the elements 0, 1, 2 are stored at locations
100, 102, 104 (assuming integer size of 2 bytes).

```
int a[3]={0,1,2};
int *p=(int *)(&a+1);//p contains 106
printf("%d\t%d", *(a+1),*(p-1));/*(100+1)=*102=1
and *(106-1)=*104=2. So, 1 2 are printed.
return 0;
}
```

Output: 1 2

8. (d)

p is a pointer to the function fun.

```
void fun(int n){ //n=6
    for(n--;    --n    ;--n)
        6    4 -> printf()    3
            2 -> printf()    1
            0->Loop stops
```

```
}
```

So, printf() is executed 2 times.



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