CS & IT ENGINEERING

Programming in C

Arrays and Pointers

Dynamic Memory Allocation

DPP 04 Discussion Notes

By- Pankaj Sharma sir

TOPICS TO BE COVERED

01 Question

02 Discussion

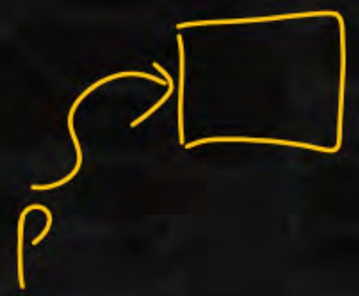
Q.1

Consider the following codes:

[MCQ]

P: void *p; ✓

p=malloc(1);



*p=65; Error

printf("%c",*(char*)p);

Q: void *p;

char a='A';

p=malloc(1);

p=&a; ✓

printf("%c",*(char*)p);

Which of the following is CORRECT?

A. Both P and Q are valid.

B. Only P is valid.

[✓ C.] Only Q is valid.

D. Neither P nor Q is valid.

Q.2

[MSQ]

```
#include <stdio.h>
#include <stdlib.h>
int * f()
{
   int *p=(int*)malloc(sizeof(int));
   *p=10;
   return p;   valid
}
    int * g(int a)
{                      Runtime
    return &a;         Error
}
    int main()
{
     printf("%p", f());//line 1   ✓
     printf("%p", g(15));//line 2  → Runtime Error
     return 0;
}
```

Which of the following statement(s) is/are INCORRECT?

A. Line 1 will result into compilation error. Incorrect

B. Line 2 will result into runtime error. correct ✓

C. The outputs are garbage values. Incorrect

D. The hexadecimal addresses of pointer Variables p and local variable are displayed. Incorrect

A, C, D

Q.3

[MCQ]

```
#include <stdio.h>
   int main()
   {
      void *p, *q;
      int a=324;
      p=&a;
      printf("%d", *(char*)p);
      return 0;
   }
```

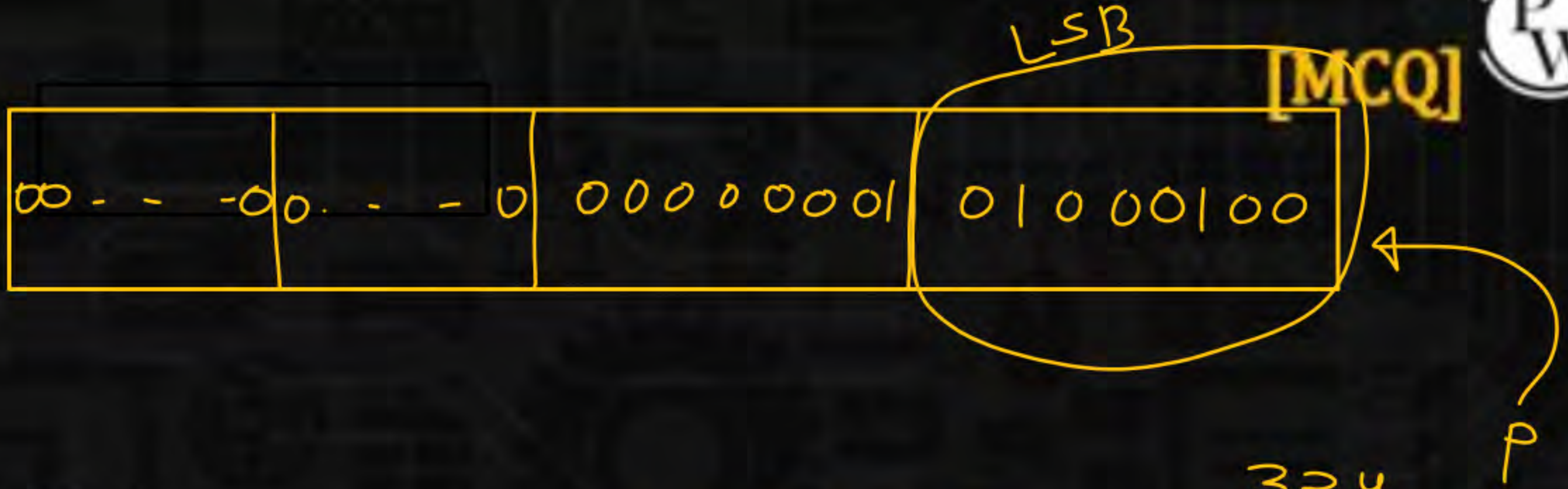
The output is-

A. Garbage value

B. Compilation error

[✓ C.] 68

D. 324



01000100

⇒ 68

324

256 + 68

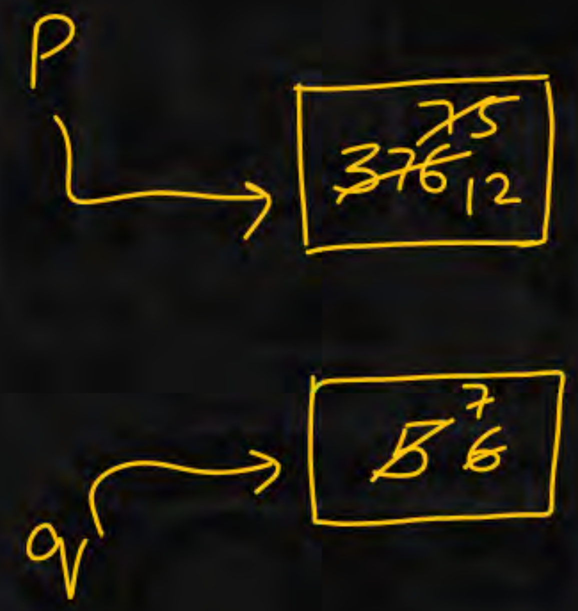
256 + 64 + 4

Q.4

[NAT]

```
#include <stdio.h>
#include <stdlib.h>
int main()
  {
    int *p=(int*)malloc(sizeof(int));
    int *q=(int*)malloc(sizeof(int));
    *p=376;
    *q=5;
  while(*p>*q){
        printf("%d\t",*p);
   *p/=*q;
   *q+=1;
  }
    return 0;
  }
```

The sum of the printed values is 463.



(i) $*p > *q$ $376 > 5 \Rightarrow$ true

pf $\Rightarrow \boxed{376}$

$*p = \frac{*p}{*q} = \frac{376}{5} = 75$

$*q = *q + 1 = 5 + 1 = 6$

(ii) $*p > *q \Rightarrow 75 > 6 \Rightarrow$ true

pf $\Rightarrow \boxed{75}$

$*p = \frac{*p}{*q} = \frac{75}{6} = \boxed{12}$

$*q = 7$

(iii) $*p > *q$

$12 > 7$

$*p \Rightarrow \boxed{12}$ pf

$*p = \frac{12}{7} = 1$

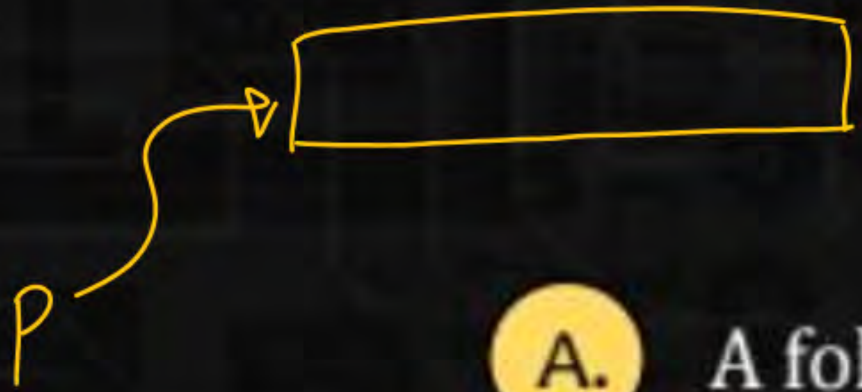
$*q = 8$

376 ✓
75 ✓
12 ✓

$\boxed{463}$

Q.5

[MCQ]



```
#include <stdio.h>
#include <stdlib.h>
    int main() {
    int count=0;
    char *p=(char *)malloc(sizeof(char));
    *p=65;              ✓
    printf("%c",*p);    A
    p=realloc(p, 4*sizeof(char));
    *p=256;             *p = 0
    printf("%d",*(int*)p);     0
    return 0;
    }
```

The output printed is-

A. A followed by Garbage values

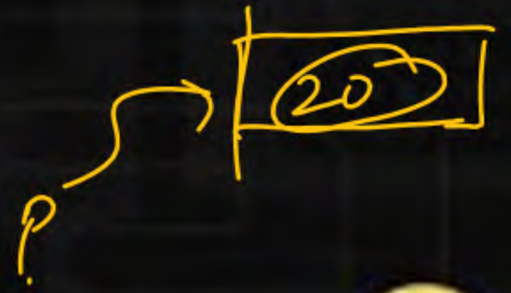
[✓ B.] A0

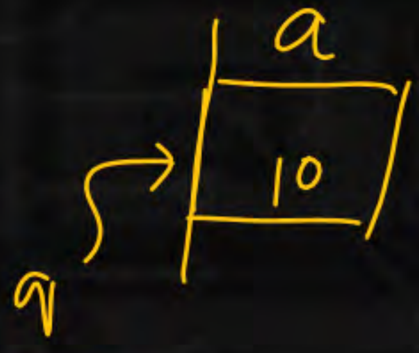
C. A512

D. Compilation error

Q.6

[MCQ]





```
#include <stdio.h>
#include <stdlib.h>
    int * f()
    {
      int *p=(int*)malloc(sizeof(int));
      *p=20;
      return p;
    }
    int * g()
    {
      static int a=10;
      int *q;
      q=&a;
      return q;
    }
    int main()
    {
      printf("%d\t", *g());//line 1     10
      printf("%d", *f());//line 2      20
      return 0;
    }
```

The output is-

A. Garbage value

B. Compilation error

[✓ C.] 10 20

D. 20 10

Q.7 When the memory is full, malloc returns-

[MCQ]

A. Void pointer

B. Wild pointer

C. Dangling pointer

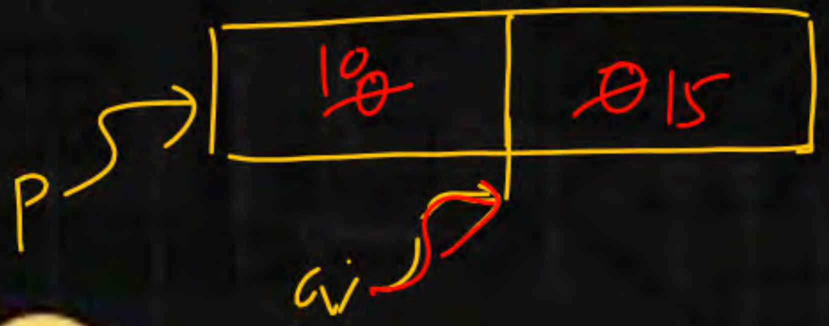
[✓ D.] NULL pointer

Q.8

[MCQ]

```
#include <stdio.h>
#include <stdlib.h>
    int main()
    {
      int *p=(int *)calloc(2, sizeof(int));
      int *q;
      q=p+1;
      printf("%d\t", *p);  ✓ 0
      printf("%d\t", *q);  ✓ 0
      *p=10;
      *q=15;
      printf("%d\t", *p);  ✓ 10
      printf("%d\t", *q);    15
      free(p); ✓
      return 0;
    }
```

The output is:



A. 10 15 Garbage 15

B. Garbage Garbage 10 15

[✓ C.] 0 0 10 15

D. 10 15 0 0

THANK YOU GW SOLDIERS !