Q.56 Which one of the choices given below would be printed when the following program is executed?

```
#include <stdio.h>
int a1[] = {6, 7, 8, 18, 34, 67};
int a2[] = {23, 56, 28, 29};
int a3[] = {-12, 27, -31};
int *x[] = {a1, a2, a3};
void print(int *a[])
{
        printf("%d,", a[0][2]);
        printf("%d,", *a[2]);
        printf("%d,", *++a[0]);
        printf("%d,", *(++a)[0]);
        printf("%d\n", a[-1][+1]);
}
main()
{
        print(x);
}
```

(A) 8,−12,7,23,8

(B) 8,8,7,23,7

(C) −12,−12,27,−31,23

(D) −12,−12,27,−31,56

GATE 2006

Q.57 What is the output printed by the following C code?

GATE 2008

```
# include <stdio.h>
int main ()
{
```

```
char a [6] = "world";
int i, j;
for (i = 0, j = 5; i < j; a [i++] = a [j--]);
printf ("%s\n", a);
}
```

(A) Dlrow (B) Null string (C) dlrld (D) worow

Q.58 C program is given below:

```
# include <stdio.h>
int main ()
{
    int i, j;
    char a [2] [3] = {{'a', 'b', 'c'}, {'d', 'e', 'f'}};
    char b [3] [2];
    char *p = *b;
    for (i = 0; i < 2; i++) {
        for (j = 0; j < 3; j++) {
        *(p + 2*j + i) = a [i] [j];
        }
    }
}
```

What should be the contents of the array b at the end of the program?

A. a b
   c d
   e f

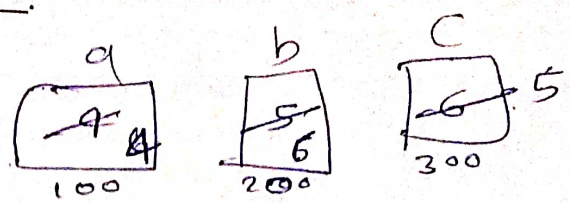
B. a d
   b e
   c f

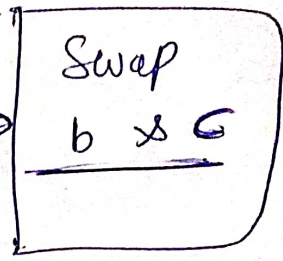
C. a c
   e b
   d f

D. a e
   d c
   b f

Q.59 The output of the following C program is_____.

```
void f1 ( int a, int b) {
        int c;
        c = a; a = b;
        b = c;
}
void f2 ( int * a, int * b) {
        int c;
        c = * a; *a = *b; *b = c;
}
int main () {
    int a = 4, b = 5, c = 6;
    f1 ( a, b);
    f2 (&b, &c);
    printf ("%d", c - a - b);
}
```





"Call by Value"

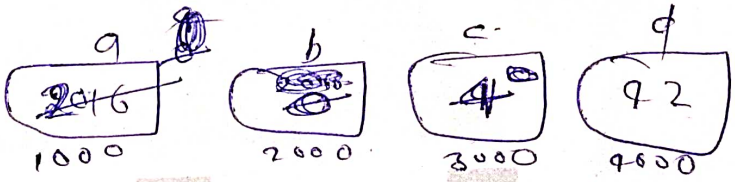
"Call by reference"

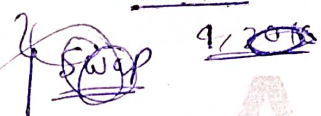
5 - 4 - 6 = -5 Ans

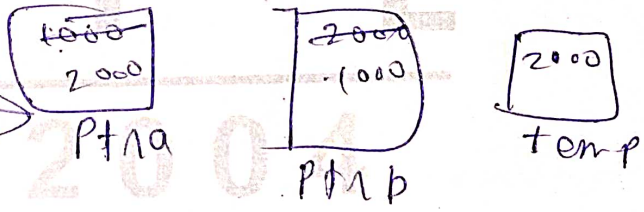
GATE 2015

Q.60 Consider the following C program.

```
# include <stdio.h>
void mystery (int *ptra, int *ptrb) {
    int *temp;
    temp = ptrb;
    ptrb =ptra;
    ptra = temp;
}
int main () {
    int a = 2016, b=0, c= 4, d = 42;
    mystery (&a, &b);
    if (a < c)
        mystery (&c, &a);
    mystery (&a, &d);
    print f("%d\n", a);
}
```







The output of the program is 2016 Ans

GATE 2016

Q.61 The value printed by the following program is_____.

```
    void f (int * p, int m) {
        m = m + 5;
```

```
    *p = *p + m;
    return;
}
void main () {
int i=5, j=10;
f (&i, j);
print f ("%d", i+j);
}
```

30 Ans

i: 5 → 10 (100) j: 10 → 20 (200)

m = 10 + 5 = 15

*p = 5 + 15 = 20

m: 15 i: 20

→ 20 + 10 = 30

GATE 2016

Q.62 Consider the following C code. Assume that unsigned long int type length is 64 bits.

```
unsigned long int fun(unsigned long int n) {
    unsigned long int i, j = 0, sum = 0;
    for( i = n; i > 1; i = i/2) j++;
    for( j; j > 1; j = j/2) sum++;
    return sum;
}
```

$\lfloor \log_2 n \rfloor \Rightarrow \log_2 2^{40} = 40$ → j

$\lfloor \log_2 40 \rfloor \Rightarrow \lfloor \log_2 2^5 \rfloor = 5$ → sum

The value returned when we call fun with the input 2^{40} is

(A) 4 (B) 5 (C) 6 (D) 40

GATE 2018

Q.63 Consider the following C program:

```
#include<stdio.h>
int main(){
int arr[] = {1, 2, 3, 4, 5, 6, 7, 8, 9, 0, 1, 2, 5}, *ip = arr + 4;
printf("%d\n", ip[1]);
return 0;
}
```

arr indices: 0 1 2 3 4 5 6 7 8 9 10 11 12

ip → 5 (index 4)

ip[1] → 6

The number that will be displayed on execution of the program is 6 Ans

GATE 2019

Q.64 Consider the following recursive function:

```
function fib (n:integer);integer;
begin
if (n=0) or (n=1) then fib := 1
else fib := fib(n-1) + fib(n-2)
end;
```

Size of activation record = 2+2 = 4 bytes

Size of a stack = 64/4 = 16

For n=17, stack will overflow

The above function is run on a computer with a stack of ~~64~~64 bytes. Assuming that only return address and parameter are passed on the stack, and that an integer value and an address takes ~~2~~2 bytes each, estimate the maximum value of ~~n~~n for which the stack will not overflow. Give reasons for your answer.

GATE 1994

Q.65 Consider the following C function:

```
int f(int n)
{
  static int i = 1;
  if (n >= 5)
    return n;
  n = n+i;
  i++;
  return f(n);
}
```

The value returned by f(1) is

(A) 5 (B) 6 (C) 7 (D) 8

GATE 2004

Q.66 Consider the following C function, what is the output?

```
#include <stdio.h>
int f(int n)
{
  static int r = 0;
  if (n <= 0) return 1;
  if (n > 3)
  {
    r = n;
    return f(n-2)+2;
  }
  return f(n-1)+r;
}

int main()
{
  printf("%d", f(5));
}
```

(A) 5 (B) 7 (C) 9 (D) 18

GATE 2007

Q.67 The function f is defined as follows:

```
int f (int n) {
  if (n <= 1) return 1;
  else if (n % 2 == 0) return f(n/2);
  else return f(3n - 1);
}
```

Assuming that arbitrarily large integers can be passed as a parameter to the function, consider the following statements.

i. The function f terminates for finitely many different values of $n \geq 1$.
ii. The function f terminates for infinitely many different values of $n \geq 1$.
iii. The function f does not terminate for finitely many different values of $n \geq 1$.
iv. The function f does not terminate for infinitely many different values of $n \geq 1$.

Which one of the following options is true of the above?

(A) (i) and (iii)
(B) (i) and (iv)
(C) (ii) and (iii)
(D) (ii) and (iv)

GATE 2007

Q.68 Consider the following function

```
double f(double x){
 if (abs(x*x - 3) < 0.01) return x;
 else return f(x/2 + 1.5/x);
}
```

Give a value q (to 2 decimals) such that f(q) will return q:_____.

(A) 1.73 (B) 2.24 (C) 4.22 (D) 3.42

GATE 2014

Q.69 What will be the output of the following C program?

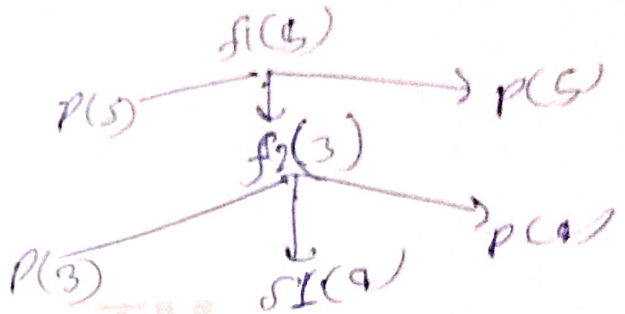
```
void count(int n)
{
  static int d = 1;
  printf("%d ", n);
  printf("%d ", d);
  d++;
  if(n > 1) count(n-1);
  printf("%d ", d);
}
int main()
{
  count(3);
}
```

(A) 3 1 2 2 1 3 4 4 4
(B) 3 1 2 1 1 1 2 2 2
(C) 3 1 2 2 1 3 4
(D) 3 1 2 1 1 1 2

GATE 2016

Q.70 Consider the following two functions.

```
void fun1(int n) {
  if(n == 0) return;
  printf("%d", n);
  fun2(n - 2);
  printf("%d", n);
}
void fun2(int n) {
  if(n == 0) return;
  printf("%d", n);
  fun1(++n);
  printf("%d", n);
}
```



53 _ _ _ _ 95

The output printed when fun1(5) is called is

(A) 534231222334455

(B)53423120112233

(C) 53423122132435

(D) 53423120213243

GATE 2017