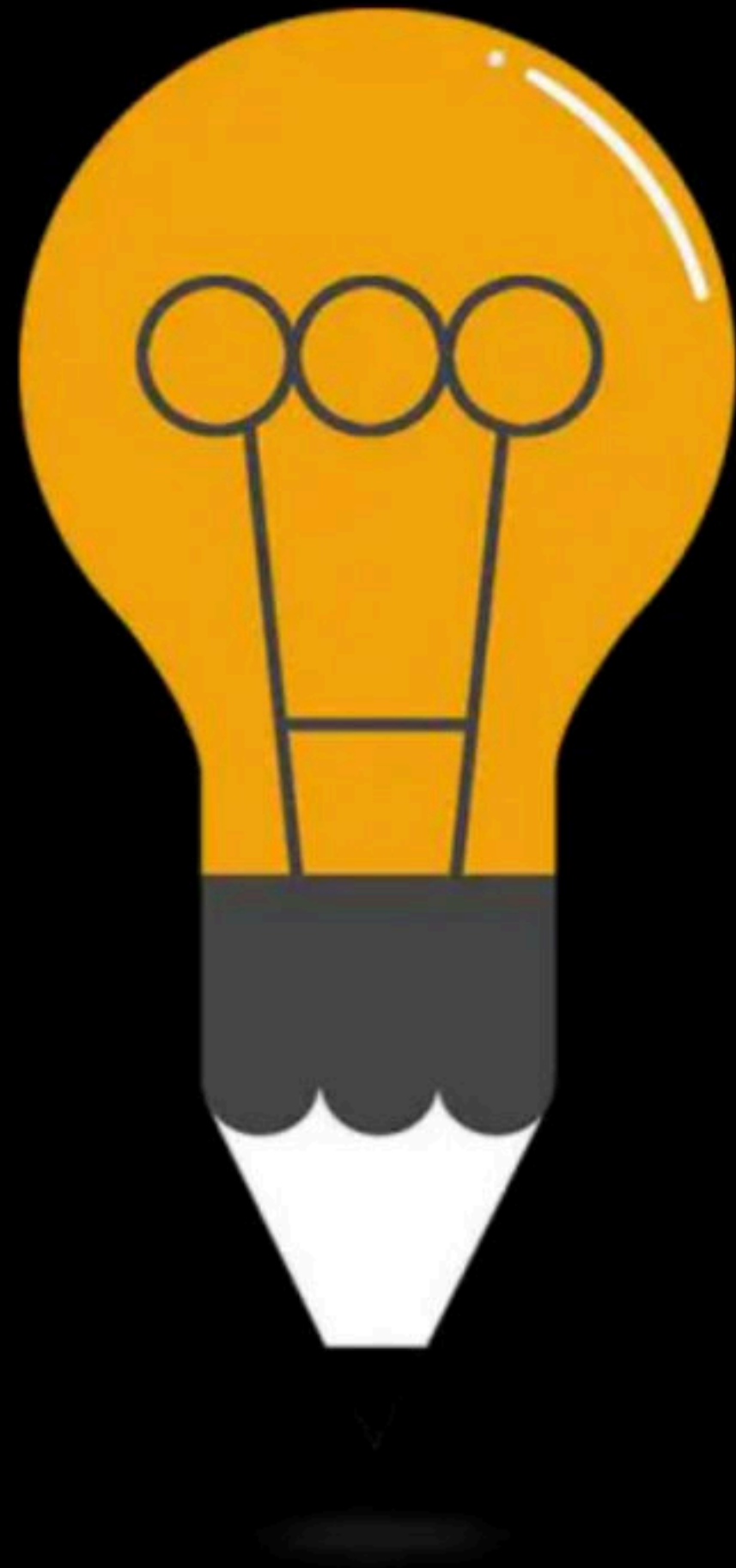




Pointer

Course on C-Programming & Data Structures: GATE - 2024 & 2025



Branching Statements & Pointers

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Branching Statements

if ✓

if else ✓

goto ✓

switch case ✓

loops

- while
- do while
- for

```
if (conditn)  
{  
    ...  
}
```

```
void main()
{ int a = 2, b = 3;
```

```
  if (a > b);
  {
    printf("a is greater");
  }
}
```

a is greater

because of ;

if(—); \Rightarrow if (a > b)
{
==
}

```
if (a > b)
  printf("a is greater");
```



```
int a = 5, b = 6;  
if (a == b)  
{  
    printf("Hello");  
}  
else  
{  
    printf("Bye");  
}  
}
```

Hello

```
int a = 5, b = 6, c = 0;  
if (a || b)  
    printf("Hello");  
else  
    printf("Bye");
```

Hello

```
int a = 5, b = 6, c = 0;
```

```
if (a < b || c) short-circuit  $\Rightarrow$  Cond 1 || Cond 2 || Cond 3
```

True

This is
not even
checked

if this
is true

Ans \Rightarrow True

```
int a = 5, b = 6, c = 0;
```

```
if (a < b || b = c)
```

```
printf("%d", b); 6
```

short-circuit in logical AND:-

cond1 && cond2 && cond3



This is false
then other conditions
are not checked

⇓
Return false

```
int a = 5, b = 6, c = 0;  
if (a > b && b = c && c = a)  
    printf("%d", b);  
else  
    printf("%d", c);
```

0

nested if else:-

```
if (cond)
{
    if (cond.)
    {
    }
}
else
{
}
}
```

if else ladder:-

```
if (cgpa == 10)
    printf("A");
else if (cgpa == 9)
    printf("B");
else if (cgpa == 8)
    printf("C");
else if (cgpa == 7)
    printf("Fail");
```


goto:-

```
int a;  
scanf("%d", &a);  
if (a > 5)  
    goto label;  
printf("no jump");  
label: printf("jump done");
```

a = 8

jump done

a = 0

no jump
jump done

Switch Case:-

```
switch (expression)
{
    case value1:       
                       
                       
                 break;
```

```
case value2:       
                    
                    
              break;
```

```
default:       
                
          break;
}
```

```
int cypa;
scanf("%d", &cypa);
switch(cypa)
{
    case 10: printf("A");
              break;
```

```
case 9: printf("B");
         break;
```

```
case 8: printf("C");
         break;
```

```
default: printf("fail");
          break;
}
```

```
int a = 5;  
switch (a + 1)  
{  
    case 5: printf("5");  
    case 6: printf("6");  
    case 7: printf("7");  
}
```

↓ fall through

67

Loops:-

loop

{

—

—

—

—

}

← will run till loop condition true

while :-

```
while (condition)
{
    _
    _
    _
    _
}
```

```
int a = 1;
```

```
while (a < 5)
```

```
{
```

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

```
    a++;
```

```
}
```

```
printf("bye bye");
```

a = ~~1~~ ~~2~~ ~~3~~ ~~4~~ 5

1234 bye bye

```
int a = 5;
```

```
while (a)
```

```
{ printf("%d", a*2);
```

```
  a--;
```

```
}
```

$a = \cancel{8} \ 4 \ \cancel{3} \ \cancel{2} \ \cancel{1} \ 0$

108642


```

int a = 5, b;
while (a)
{
    b = a + 2;
    printf("%d\n", b);
    a -= 2;
}

```

$a = \cancel{5} \cancel{3} \cancel{1} \rightarrow -3$

$b = \cancel{7} \cancel{5} \cancel{3} \cancel{1} \rightarrow 1$

$-3 \quad -5 \quad \dots$

do while

while (condition)

{

}

do

{

||
||
||
||
||

} while (condition);

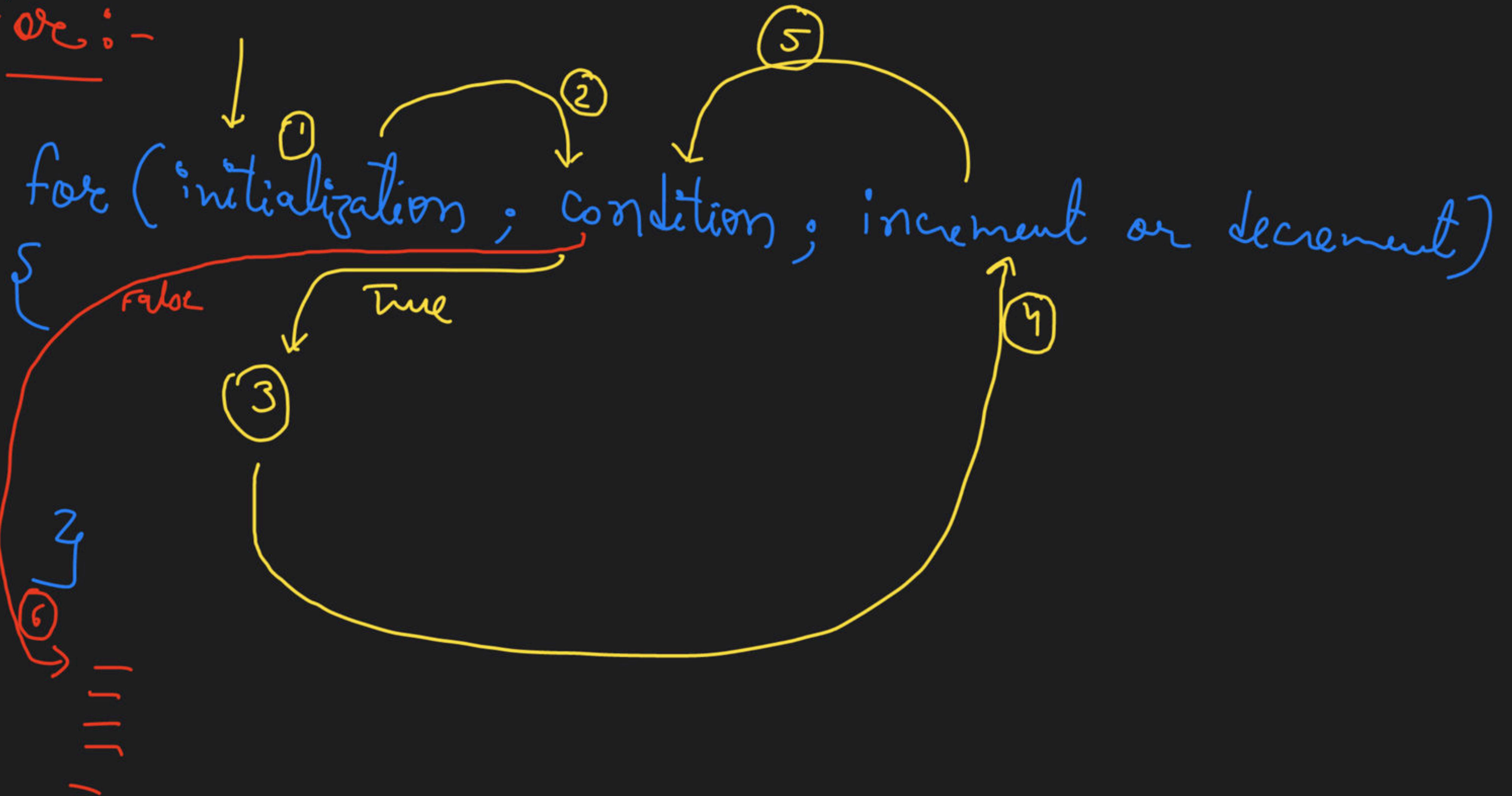
while

- ① Entry controlled loop
- ② min. no. of times loop body executes = 0
- ③ no semicolon at the end of while statement

do while

- ① Exit controlled loop
- ② min. no. of time loop body executes = 1
- ③ semicolon compulsory at the end of while statement

for:-



```
int a;
```

```
a = 1;
```

```
while (a <= 10)
```

```
{  
    printf("%d ", a);
```

```
    a++;
```

```
}
```

```
int a;
```

```
for (a = 1; a <= 10; a++)
```

```
{
```

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

```
}
```

~~a = 1 2 3 4 ... 10~~

1 2 3 4 ... 10

for(; condition ; inc)

for(; cond ;)

for(i=0, j=10, k=20 ; condition ; i++, j--, k-=3)
{

}


```
int a, b;  
for (a = 1; a <= 3; a++)  
{  
    for (b = a; b <= 3; b++)  
    {  
        printf("%d ", b);  
    }  
    printf("\n");  
}
```

a = ~~1~~ ~~2~~ ~~3~~ 4
b = ~~1~~ ~~2~~ ~~3~~ ~~4~~ 2 ~~3~~ ~~4~~ ~~3~~ 4

1 2 3
2 3
3

loop control statements \Rightarrow break
continue

```
int a;  
for(a=1; a<=5; a++)  
{  
    if(a==3)  
        break;  
    printf("%d ", a);  
}
```

a = 1 2 3

1 2

```
int a;  
for(a=1; a<=5; a++)  
{  
    if(a==3)  
        continue;  
    printf("%d ", a);  
}
```

a = 1 2 3 4 5 6

1 2 4 5

```

int i, j;
for (i = 5; i >= 1; i--)
{
    for (j = i; j >= 1; j--)
    {
        if (j == 1)
            break;
        printf("%d ", i);
    }
    printf("\n");
}

```

~~i = 5~~ 4 3 2 1
~~j = 4~~ 3 2 1 1

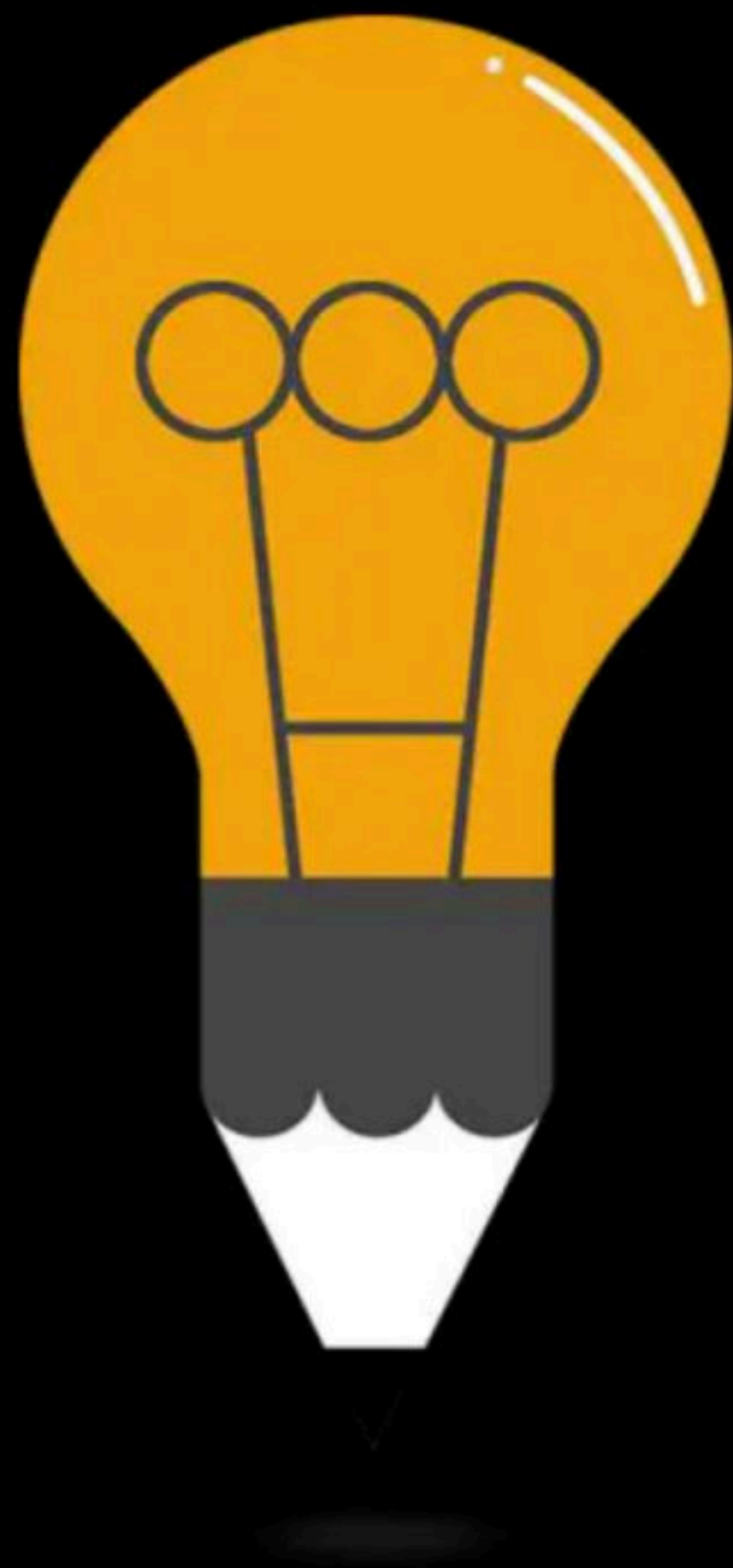
5 5 5 5

4 4 4

3 3

2

Pointers



DPP 2

By: Vishvadeep Gothi

Question

What is the output of the following programs-

```
#include<stdio.h>
void main(){
    int i=0;
    if(i==2) printf("This is else");
    else printf("This is if");
    printf("%d",i);
}
```

- (a) This is if2
- (b) This is if0
- (c) This is else2
- (d) This is else 0
- (e) Compilation error

Question

What is the output of the following programs-

```
#include<stdio.h>
void main(){
int i=20,j=20;
if(i==2?(i=21):(j=21))
    printf("GATE 2023");
else
    printf("Happy Learning");
printf("%d%d",i,j);
}
```

- (a) GATE 2023 2021
- (b) Happy Learning 2021
- (c) GATE 2023 2020
- (d) Happy Learning 2020
- (e) Error

Question

What is the output of the following programs-

```
void main(){
int i=1,j=3;
if(--i || (j==4) ) {
if(printf("You are in first if")) printf("%d%d",i,j);
if(++i) printf("You are in second if");
}
else printf("You are in else");
}
```

- (a) You are in first if 0 4 You are in else
- (b) 0 4 You are in second if
- (c) You are in first if 0 4 You are in second if
- (d) You are in first if 0 3 You are in second if
- (e) Compilation error

Question

What is the output of the following programs-

```
void main(){  
int choice=2;  
switch(choice){  
case 1: printf("1");  
case 2: printf("2");  
case 3: printf("3");  
    break;  
default: printf("Default");  
}  
}
```

- (a) Compiler error
- (b) Runtime error
- (c) 23
- (d) 2
- (e) Default

Question

What is the output of the following programs-

```
void main(){
int choice=2;
switch(choice){
case 1: printf("One");
case 2: printf("Two");
case 3: printf("Three");
    break;
default: printf("Why here?");
}
}
```

- (a) Compiler error
- (b) Runtime error
- (c) Two
- (d) Two Three
- (e) Why here?

Question

What is the output of the following programs-

```
void main(){  
float choice=1.6;  
switch(choice){  
case 1.6: printf("GATE 2023"); break;  
default: printf("Why Here?"); break;  
}  
}
```

- (a) GATE 2023
- (b) Why Here?
- (c) Runtime error
- (d) Compilation error
- (e) Nothing displayed

Question

What is the output of the following programs-

```
void main(){  
    int j=4;  
    switch(j)  
    {  
    default: printf("Default"); break;  
    case 1: printf("V1");  
    case 2: printf("V2");  
    case 3: printf("V3");  
    }  
}
```

- (a) Runtime error
- (b) Compilation error
- (c) V1V2V3
- (d) Default

Question

What is the output of the following programs-

```
int main(){  
int a=12;  
switch(a){  
case 11: a++;  
case 12: a- -;  
case 13: a=a+1;  
default: a=27;  
}  
printf("%d",a);  
}
```

- (a) Runtime error
- (b) Compilation error
- (c) 35
- (d) 12
- (e) 11

Question

What is the output of the following programs-

```
void main(){  
char ch='v';  
switch(ch+1){  
case 'v': printf("I am Vishvadeep");  
case 'w': printf("I am Wonderful");  
default: printf("Yaha Kyu?");  
}  
}
```

- (a) I am Vishvadeep
- (b) I am Wonderful
- (c) Yaha Kyu?
- (d) Compilation error
- (e) Runtime error

Question

What is the output of the following programs-

```
Int main(){  
printf("Let's Party\n");  
exit(0);  
printf("Let's Study");  
Return 0;  
}
```

- (a) Let's Party
- (b) Let's Party
Let's Study
- (c) Let's Party
- (d) Compilation error

Happy Learning.!

