

**Shri Ramdeobaba College of Engineering and Management, Nagpur**  
**Department of CSE (Cyber Security)**  
**Session: 2023-2024**  
**Compiler Design Lab CCP308**

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**Batch:** C1

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**PRACTICAL No. 05**

**Topic:** Three Address Code Generation

**Platform:** Windows or Linux

**Language to be used:** Python or Java (based on the companies targeted for placement)

**CO Mapped:** CO4- Learn three address code generation and implement code optimization techniques for improving the performance of a program segment.

**Aim:** Write a program to generate three address code for the given language construct using SDTS.

- (a) Odd Roll Numbers : if-then-else,
- (b) Even Roll Numbers: while loop

Input: **Example for if-then-else**

```
if (a<5)
{
    c= b+d
}
else
{
    d= a+ b
}
```

Output:

- 1) if ( a<5) goto 3
- 2) Goto\_6
- 3) T1=b+d
- 4) c=T1
- 5) goto 8
- 6) T3=a+b
- 7) d=T3
- 8) END

Input: **Example for while-loop**

```
i = 0
while (i<10)
{
    a = b * c;
    i = i + 1;
}
```

Output:

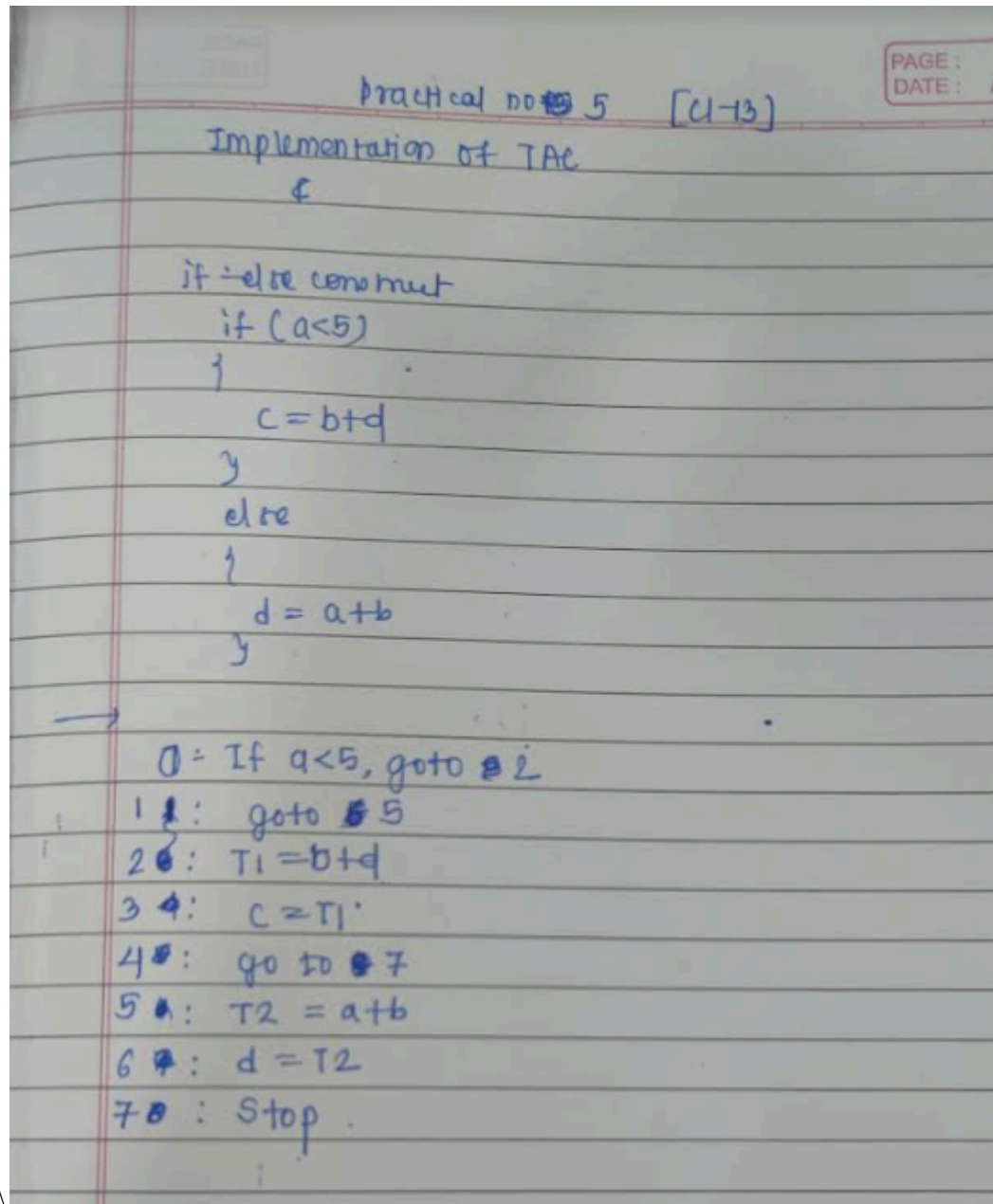
- 1 i = 0
- 2 while i< 10 goto 4

```

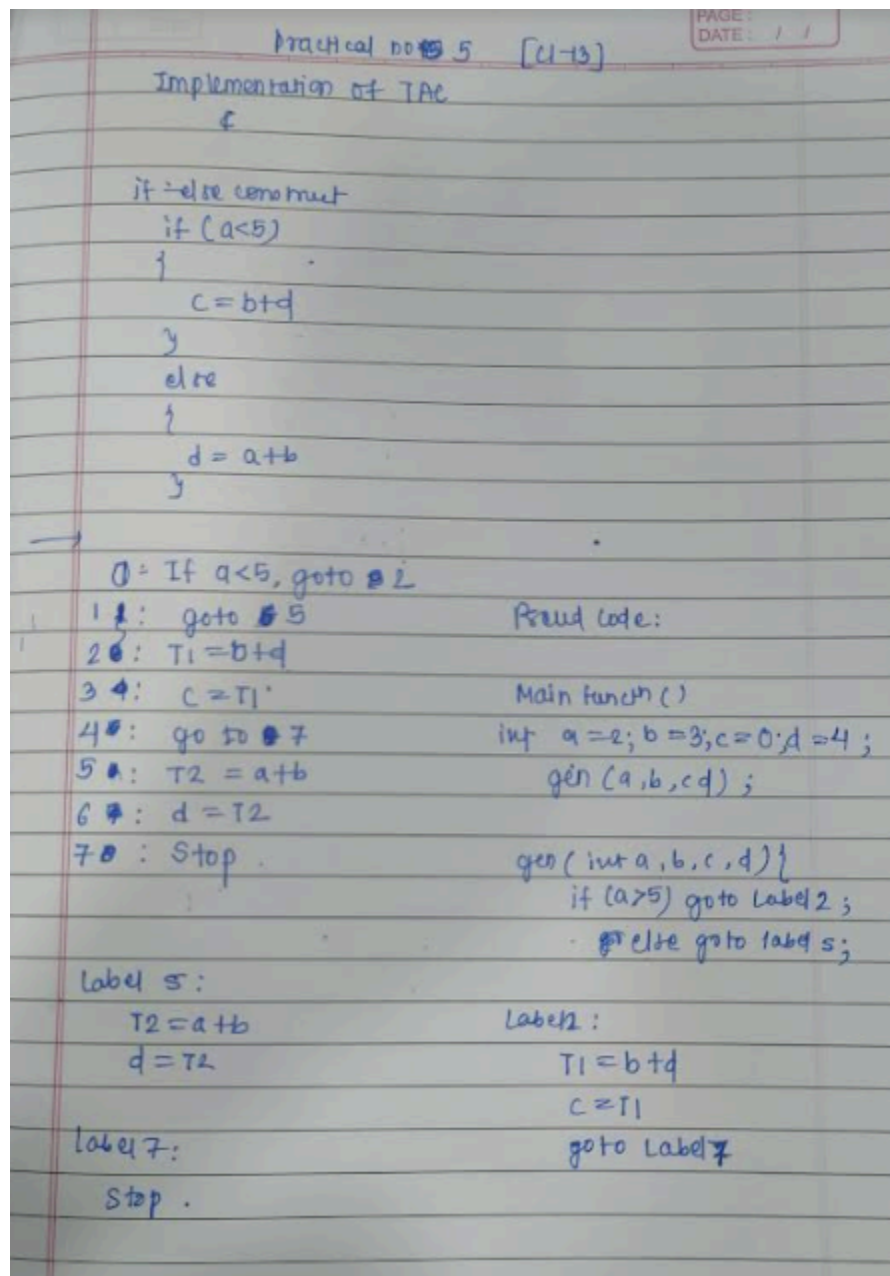
3  goto 9
4  t1 = b * c
5  a = t1
6  t2 = i + 1
7  i = t2
8  goto 2
9  end

```

Copy Screenshot TAC:



## Copy Screenshot Logic/Pseudo Code:



## Program:

```
#include <stdio.h>
```

```
void generate_three_address_code(int a, int b, int c, int d) {
    // Condition for if statement
    if (a > 5)
        goto Label2;
    else
        goto Label5;
```

```
Label2: // Code inside if block
    int T1;
    T1 = b + d;
    c = T1;
```

```
goto Label7;

Label5: // Code inside else block
    int T2;
    T2= a + b;
    d = T2;

Label7: // Stop
    printf("Stop\n");
}

int main() {
    // Example usage
    int a = 2; // Example value for a
    int b = 3; // Example value for b
    int c = 0; // Example value for c
    int d = 4; // Example value for d

    generate_three_address_code(a, b, c, d);

    return 0;
}
```

Output:

```
Shell

[0] - if (a > 5) goto [2]
[1] - goto [5]
[2] - T1 = b + d
[3] - c = T1
[4] - goto [7]
[5] - T2 = a + b
[6] - d = T2
[7] - Stop
> |
```