C Programming — Exam Focused Notes

40 Marks Exam • 3 Sets → Answer Any 2 • Algorithm & Flowchart ■■■

Most important: Variable, Data Type, Operator, if-else, switch, for loop, while loop.

1. C Program Basic Structure

A C program normally contains header files, the main() function, declarations, statements and return 0.

```
#include <stdio.h>
int main() {
  printf("Hello World");
  return 0;
}
```

2. Variable

Definition: A variable is a named memory location used to store a value that can change during program execution.

```
Syntax: data_type variable_name = value;
```

```
int age = 20;
float price = 25.5;
char grade = 'A';
```

3. Data Types

Data type	Use	Example
int	Integer numbers	int x = 10;
float	Decimal numbers	float x = 2.5;
double	More precision decimal	double x = 2.55;
char	Single character	char c = 'A';

4. Operators

Arithmetic: +, -, *, /, %
Relational: ==, !=, >, <, >=, <=
Logical: && (AND), || (OR), ! (NOT)
Assignment: =, +=, -=, *=, /=
Increment/Decrement: ++, --

```
int a=10, b=3;
printf("%d", a+b); // 13
printf("%d", a%b); // 1
```

5. if-else

Definition: if-else is a decision-making statement. It executes one block when a condition is true and another block when it is false.

```
if (condition) {
  // true block
} else {
  // false block
}
```

Example — Even/Odd

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

```
  int n;
  scanf("%d", &n);
  if (n % 2 == 0)
    printf("Even");
  else
    printf("Odd");
  return 0;
}
```

6. Common if-else Programs

Positive / Negative / Zero

```
if (n > 0) printf("Positive"); else if (n < 0) printf("Negative"); else printf("Zero");
```

Largest of 2

```
if (a > b) printf("%d", a); else printf("%d", b);
```

Largest of 3

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

Grade

```
if (mark >= 80) printf("A+"); else if (mark >= 70) printf("A"); else if (mark >= 60)
printf("B"); else if (mark >= 50) printf("C"); else printf("F");
```

7. switch

Definition: switch is a selection statement used when one expression needs to be compared with several fixed cases.

```
switch (choice) {
case 1: printf("One"); break;
case 2: printf("Two"); break;
default: printf("Invalid");
}
```

Calculator using switch

```
int a,b,choice;
scanf("%d%d",&a,&b);
scanf("%d",&choice);
switch(choice) {
case 1: printf("%d",a+b); break;
case 2: printf("%d",a-b); break;
case 3: printf("%d",a*b); break;
case 4: printf("%d",a/b); break;
default: printf("Invalid");
}
```

Remember: break prevents fall-through to the next case. default runs when no case matches.

8. for Loop

Definition: A for loop repeats a block of code while a loop condition remains true.

```
for (initialization; condition; update) {
  // statements
}
```

1 to N

```
int n,i;
scanf("%d",&n);
for(i=1;i<=n;i++) printf("%d ",i);
```

Sum 1 to N

```
int n,i,sum=0;
scanf("%d",&n);
for(i=1;i<=n;i++) sum += i;
printf("%d",sum);
```

Multiplication Table

```
int n,i;
scanf("%d",&n);
for(i=1;i<=10;i++) printf("%d x %d = %d\n",n,i,n*i);
```

Factorial

```
int n,i,f=1;
scanf("%d",&n);
for(i=1;i<=n;i++) f *= i;
printf("%d",f);
```

9. while Loop

Definition: A while loop checks the condition first, then executes the loop body if the condition is true.

```
while (condition) {
  // statements
}
```

Example — print 1 to N

```
int i=1,n;
scanf("%d",&n);
while(i<=n) {
  printf("%d ",i);
  i++;
}
```

10. Digit Sum using while

```
int n,sum=0,d;
scanf("%d",&n);
while(n>0) {
  d=n%10;
  sum += d;
  n=n/10;
}
printf("%d",sum);
```

11. Exam Practice — Very Likely Questions

1. Define variable and write two examples.

2. Explain int, float, double and char with examples.

3. Write a C program to check even or odd.

4. Write a C program to check positive, negative or zero.

5. Find the largest among two/three numbers using if-else.

6. Write a grade calculation program using if-else.

7. Explain arithmetic, relational and logical operators with examples.

8. Write a calculator program using switch.

9. Write a switch program to display a day from 1–7.

10. Write a for-loop program to print 1 to N.

11. Find the sum of 1 to N using for loop.

12. Print a multiplication table using for loop.

13. Find factorial using for loop.

14. Print even numbers using while/for loop.

15. Find the sum of digits using while loop.

16. Write a star pattern using nested/for loops.

12. Last-Minute Revision Checklist

✓ Variable declaration & initialization
✓ int/float/double/char
✓ + - * / %
✓ ==, !=, >, <, >=, <=
✓ &&, ||, !
✓ if / else if / else
✓ switch + case + break + default
✓ for loop syntax and counting
✓ while loop and increment
✓ Even/Odd, Largest, Grade, Calculator, Sum, Table, Factorial, Digit Sum