C Basics Program with Full Code and Highlighted Sections

Complete C Program Code

```
#include <stdio.h> // Header file

// symbolic constant
#define PI 3.14

// Function declaration
int add(int a, int b); // Function prototype (used in compound statements section)

int main() {
    // 1. Character set, Identifiers and Keywords
    int num1 = 10, num2 = 20; // identifiers: num1, num2 | keyword: int

    // 2. Data types
    float radius = 5.5;
    char grade = 'A';
    double area;

    // 3. Constants
    const int maxLimit = 100; // constant declaration

    // 4. Variables and Arrays
    int marks[5] = {80, 85, 90, 95, 100}; // array of integers

    // 5. Declarations
    int i, result;

    // 6. Expression statements
    result = num1 + num2 * 2; // expression using arithmetic operators

    // 7. Symbolic constants
    area = PI * radius * radius;

    // 8. Compound statements
    {
        int sum = add(num1, num2); // block of statements (compound)
        printf("Sum = %d\n", sum);
    }

    // 9. Arithmetic operators
    int total = num1 + num2 - 5 * 2 / 1;

    // 10. Unary operators
    i = 0;
    ++i; // pre-increment
    --i; // pre-decrement

    // 11. Relational and Logical operators
```

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```
    if (num1 < num2 && num1 > 0) {
        printf("num1 is less than num2 and greater than 0\n");
    }

    // 12. Assignment operators
    int x = 5;
    x += 10; // same as x = x + 10

    // 13. Conditional operators
    int max = (num1 > num2) ? num1 : num2;
    printf("Max = %d\n", max);

    // 14. Bit operators
    int a = 5, b = 3;
    printf("Bitwise AND = %d\n", a & b); // AND
    printf("Bitwise OR = %d\n", a | b);  // OR
    printf("Bitwise XOR = %d\n", a ^ b); // XOR

    return 0;
}

// Function definition
int add(int a, int b) {
    return a + b;
}
```

1. Header and Symbolic Constants

```
#include <stdio.h>
#define PI 3.14
```

2. Function Declaration

```
int add(int a, int b);
```

3. Main Function Start

```
int main() {
```

4. Identifiers, Keywords, Data Types

```
int num1 = 10, num2 = 20;
float radius = 5.5;
char grade = 'A';
double area;
```

5. Constants and Arrays

```
const int maxLimit = 100;
int marks[5] = {80, 85, 90, 95, 100};
```

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6. Declarations and Expressions

```
int i, result;
result = num1 + num2 * 2;
```

7. Symbolic Constant in Expression

```
area = PI * radius * radius;
```

8. Compound Statement Block

```
{
    int sum = add(num1, num2);
    printf("Sum = %d\n", sum);
}
```

9. Arithmetic and Unary Operators

```
int total = num1 + num2 - 5 * 2 / 1;
i = 0;
++i;
--i;
```

10. Relational and Logical Operators

```
if (num1 < num2 && num1 > 0) {
    printf("num1 is less than num2 and greater than 0\n");
}
```

11. Assignment and Conditional Operators

```
int x = 5;
x += 10;
int max = (num1 > num2) ? num1 : num2;
printf("Max = %d\n", max);
```

12. Bitwise Operators

```
int a = 5, b = 3;
printf("Bitwise AND = %d\n", a & b);
printf("Bitwise OR = %d\n", a | b);
printf("Bitwise XOR = %d\n", a ^ b);
```

13. Return Statement

```
return 0;
}
```

14. Function Definition

```
int add(int a, int b) {
```

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```
    return a + b;
}
```