Questions

1. Write a C program to input two integers and perform the following operations:

    o Addition

    o Subtraction

    o Multiplication

    o Division

    o Modulus

2. Write a C program to calculate the area and perimeter of a rectangle using arithmetic operators.

3. Write a C program to swap two numbers without using a third variable (use arithmetic operators).

4. Write a C program to check whether a number is divisible by both 3 and 5 using logical operators.

5. Write a C program to display the size of every basic data type using the size of operator.

6. Write a C program to illustrate the use of:

    o Unary prefix increment and decrement operators

    o Unary postfix increment and decrement operators

7. Write a C program to input two numbers and display the maximum number.

8. Write a C program to find the largest of three numbers using the ternary operator.

9. Write a C program to demonstrate the working of the type casting operator.

10. Write a C program to reverse the bits of an integer using bitwise operators.

Answers

1. Arithmetic Operations

Question Explanation:

This program takes two integers and performs addition, subtraction, multiplication, division, and modulus operations.

Program Code:

```c
#include <stdio.h>
int main() {
    int a, b;
    printf("Enter two numbers: ");
    scanf("%d %d", &a, &b);
    printf("Addition = %d\n", a+b);
    printf("Subtraction = %d\n", a-b);
    printf("Multiplication = %d\n", a*b);
    printf("Division = %.2f\n", (float)a/b);
    printf("Modulus = %d\n", a%b);
    return 0;
}
```

Code Explanation:

Arithmetic operators perform mathematical calculations. Type casting ensures correct division result.

2. Area and Perimeter of Rectangle

Question Explanation:

This program calculates area and perimeter using arithmetic operators.

Program Code:

```c
#include <stdio.h>
int main() {
    float length, breadth;
    printf("Enter length and breadth: ");
    scanf("%f %f", &length, &breadth);
    printf("Area = %.2f\n", length*breadth);
    printf("Perimeter = %.2f\n", 2*(length+breadth));
    return 0;
}
```

Code Explanation:

Area = length × breadth. Perimeter = 2 × (length + breadth).

3. Swap Without Third Variable

Question Explanation:

This program swaps two numbers using arithmetic operators.

Program Code:

```c
#include <stdio.h>
int main() {
    int a, b;
    printf("Enter two numbers: ");
    scanf("%d %d", &a, &b);
    a = a + b;
    b = a - b;
    a = a - b;
    printf("After swap: a=%d b=%d", a, b);
    return 0;
}
```

Code Explanation:

Values are swapped using addition and subtraction without extra variable.

4. Divisible by 3 and 5

Question Explanation:

This program checks divisibility using logical AND operator.

Program Code:

```c
#include <stdio.h>
int main() {
    int num;
    printf("Enter number: ");
    scanf("%d", &num);
    if(num%3==0 && num%5==0)
        printf("Divisible by 3 and 5");
    else
        printf("Not divisible by both");
    return 0;
}
```

Code Explanation:

Logical AND (&&) ensures both conditions are true.

5. Size of Data Types

Question Explanation:

This program displays size of different data types using sizeof operator.

Program Code:

```c
#include <stdio.h>
int main() {
    printf("Size of int = %lu\n", sizeof(int));
    printf("Size of float = %lu\n",
sizeof(float));
    printf("Size of double = %lu\n",
sizeof(double));
    printf("Size of char = %lu\n", sizeof(char));
    return 0;
}
```

Code Explanation:

sizeof returns memory size (in bytes) of data types.

6. Prefix and Postfix Operators

Question Explanation:

This program demonstrates prefix and postfix increment/decrement operators.

Program Code:

```c
#include <stdio.h>
int main() {
    int a = 5;
    printf("Prefix ++a = %d\n", ++a);
    printf("Postfix a++ = %d\n", a++);
    printf("Value after postfix = %d\n", a);
    return 0;
}
```

Code Explanation:

Prefix updates value before use. Postfix updates after use.

7. Maximum of Two Numbers

Question Explanation:

This program finds maximum using if-else.

Program Code:

```c
#include <stdio.h>
int main() {
    int a,b;
    printf("Enter two numbers: ");
    scanf("%d %d",&a,&b);
    if(a>b)
        printf("Maximum = %d",a);
    else
        printf("Maximum = %d",b);
    return 0;
}
```

Code Explanation:

Comparison operator determines greater value.

8. Largest of Three (Ternary)

Question Explanation:

This program finds largest of three numbers using ternary operator.

Program Code:

```c
#include <stdio.h>
int main() {
    int a,b,c,largest;
    printf("Enter three numbers: ");
    scanf("%d %d %d",&a,&b,&c);
    largest = (a>b) ? ((a>c)?a:c) : ((b>c)?b:c);
    printf("Largest = %d",largest);
    return 0;
}
```

Code Explanation:

Ternary operator selects value based on condition.

9. Type Casting

Question Explanation:

This program shows explicit type casting.

Program Code:

```c
#include <stdio.h>
int main() {
    int a = 5, b = 2;
    float result;
    result = (float)a / b;
    printf("Result = %.2f", result);
    return 0;
}
```

Code Explanation:

Type casting converts int to float to get decimal result.

10. Reverse Bits Using Bitwise Operators

Question Explanation:

This program reverses bits of an integer.

Program Code:

```c
#include <stdio.h>
int main() {
    unsigned int num, rev=0;
    int i;
    printf("Enter number: ");
    scanf("%u",&num);
    for(i=0;i<32;i++){
        rev <<=1;
        rev |= (num & 1);
        num >>=1;
    }
    printf("Reversed bits = %u",rev);
    return 0;
}
```

Code Explanation:

Bitwise operators shift and extract bits to reverse binary representation.