Assignment - BITWISE OPERATIONS

Q1. Set, Clear and Toggle a Bit
Given an 8-bit unsigned variable:

```
uint8_t reg = 0x2A;   // 0010 1010
```

Perform the following operations using bitwise operators:
1. Set bit number 4
2. Clear bit number 1
3. Toggle bit number 5

Print the value of reg in hexadecimal and binary after each operation.

Q2. Check a Bit and Take Decision
Write a C program to check whether bit number 3 of the following variable is SET or CLEAR.

```
uint8_t status = 0x08;
```

If bit 3 is set, print:
Bit 3 is SET

Otherwise, print:
Bit 3 is CLEAR

Use only bitwise AND operation for checking.

Q3. Masking – Extract Bits
Given a 16-bit register value:

```
uint16_t reg = 0xABCD;
```

Perform the following tasks:
1. Extract the lower 4 bits

2. Extract the upper 4 bits of the lower byte

Print the extracted values in hexadecimal format.

Q4. Left Shift and Right Shift

Write a C program to demonstrate left shift and right shift operations.

uint8_t value = 5;

1. Left shift the value by 2 positions
2. Right shift the original value by 1 position

Print the result after each operation.

Explain how left shift and right shift are related to multiplication and division by powers of 2.

Q5. Read and Write Bit Field

Given an 8-bit register:

uint8_t reg = 0xAA; // 1010 1010

1. Read the value of bits from bit 2 to bit 4
2. Write the value 0b011 into bits 2 to 4 without changing other bits

Print the register value before and after modification.