1. What are Zoombie Process?
2. What are different types of variables used in shell script?
3. What are the different types of modes available in Vi editor?
4. What are the different types of permission at file level in shell?
5. How to use comments in shell script.

Student Work Area

Algorithm/Flowchart/Code/Sample output/Question Bank Solutions

a)

main.bash

```bash
#!/bin/bash

# Read a number from the user
echo "Enter a number: "
read num

# Check if the number is even or odd using modulo operation
if [ $((num % 2)) -eq 0 ]; then
    echo "$num is an even number."
else
    echo "$num is an odd number."
fi
```

b)

main.bash

```bash
#!/bin/bash

# Function to check if a number is prime
is_prime() {
    num=$1
    if [ $num -le 1 ]; then
        return 1  # Not prime
    fi

    for (( i=2; i*i<=num; i++ ))
    do
        if [ $((num % i)) -eq 0 ]; then
            return 1  # Not prime
        fi
    done

    return 0  # Prime
}

# Read a number from the user
echo "Enter a number: "
read num

# Check if the number is prime
if is_prime $num; then
    echo "$num is a prime number."
else
    echo "$num is not a prime number."
fi
```

c)

main.bash

```bash
#!/bin/bash

# Function to check if a number is a palindrome
is_palindrome() {
    num=$1
    # Store the original number
    original_num=$num
    reversed_num=0

    # Reverse the number
    while [ $num -gt 0 ]; do
        remainder=$((num % 10))
        reversed_num=$((reversed_num * 10 + remainder))
        num=$((num / 10))
    done

    # Check if the reversed number is the same as the original number
    if [ $reversed_num -eq $original_num ]; then
        return 0  # Palindrome
    else
        return 1  # Not a palindrome
    fi
}

# Read a number from the user
echo "Enter a number: "
read num

# Check if the number is a palindrome
if is_palindrome $num; then
    echo "$num is a palindrome."
else
    echo "$num is not a palindrome."
fi
```

d)

main.bash

```bash
#!/bin/bash

# Function to get the day of the week based on the number
get_day() {
    case $1 in
        1) echo "Monday" ;;
        2) echo "Tuesday" ;;
        3) echo "Wednesday" ;;
        4) echo "Thursday" ;;
        5) echo "Friday" ;;
        6) echo "Saturday" ;;
        7) echo "Sunday" ;;
        *) echo "Invalid number! Please enter a number between 1 and 7." ;;
    esac
}

# Read a number from the user
echo "Enter a number between 1 and 7: "
read num

# Get the corresponding day of the week
get_day $num
```

Answer – 1: A Zombie process is a process that has completed execution but still has an entry in the process table. This occurs when a child process terminates, but its parent process doesn't acknowledge the termination by waiting for it. As a result, the child process remains in the process table, occupying system resources.

Characteristics of a Zombie process:

1. Process has terminated, but its entry remains in the process table.

2. Parent process has not waited for the child process to terminate.

3. Process is no longer executing, but still consumes system resources.

4. Process is denoted by a "Z" status in the process table (e.g., ps aux command).

Zombie processes can be removed by:

1. Parent process waiting for the child process using wait() system call.

2. Parent process terminating, which automatically removes the Zombie process.

3. System reboot, which clears all process table entries.