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Daffodil International University

Faculty of Science & Information Technology

Department of Computer Science & Engineering

CT-02, Fall 2026

Course Code: CSE323, Section: O, Course Title: Operating System

Time: 30 Mints | Marks: 15

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

```
#include <stdio.h>
#include <unistd.h>
#include <sys/types.h>

int main() {
    pid_t pid = fork();

    if (pid == 0) {
        printf("Child: PID = %d\n", getpid());
        sleep(3);
        printf("Child: Execution completed\n");
    }
    else {
        printf("Parent: PID = %d\n", getpid());
        sleep(1);
        printf("Parent: Execution completed\n");
    }

    return 0;
}
```

1.	Explain how fork() creates a new process with a diagram. Identify the parent and child processes in this program and state the return value of fork() in each process.	[4]
2.	Explain whether a zombie or an orphan process can occur during the execution of this program. Justify your answer using the execution sequence.	[4]
3.	Modify only one line of the program to ensure that the parent waits for the child to finish before terminating. Write the modified line and explain its effect.	[3]
4.	Suppose the child process must send the message "Task completed" to the parent process instead of relying on printf(). Identify a suitable IPC mechanism and explain with a diagram how it can accomplish this communication.	[4]