Bahria University



Lahore Campus

# Mid-Term Exams (spring-2024 Semester)

*Department of Computer Sciences*

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| Paper Show Date & Time:  **04-04-2024/8:00-940 AM** |

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| **Exam Date & Time** | **04-04-2024/8:00-940 AM** | **Session** | **Spring 2024** |
| **Instructor Name** | **ABDULLAH** | **Program/Semester:** | **BSCS/5A** |
| **Course Title** | **Operating System Lab** | **Course Code:** | **CSL-320** |
| **Time Allowed** | **90 mins** | **Max Marks** | **20** |

**Instructions:**

**Read out the Instructions carefully.**

1. **Read the exam carefully and attempt all the questions**
2. **Understanding of all questions is the part of the exam**
3. **Copied answers will straight away be awarded with *ZERO***
4. **For Output you need to take full screen *Screenshot* and paste it in the given space.**
5. **Submission method is as follows; it should be strictly followed otherwise marks will be deducted**

**Make a Folder to add this word solution file in the folder naming “*Name\_Enroll\_Midterm\_Section*” along with the .c and. s files of each programming question. The .c and. s file name should be saved according to the question no i.e. “*Q1.s*”.**

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**Student Name** ……………………………. **Enrollment Number**:………………………………

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| **Evaluation of CLO** | **Ques # / Part #** | **Marks** | **Obtained Marks** |
| **CLO1: Implement OS concepts like those of shell scripting, processes, file-manipulation and inter-process communication** | 1 | 7 |  |
| 2 | 5 |
| 3 | 8 |
| **Total Marks** | 20 |  |  |
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**Question No 01:**  Suppose you are working on a process state model for a simple operating system. Your model has three states: running, ready, and blocked. You need to write a function that will update the state of a process based on its current state and any events that occur.

Write a function in C that takes two arguments: the current state of a process (represented as a string) and an event (also represented as a string). The function should return the new state of the process based on the following rules:

If the current state is "running" and the event is "block", the new state should be "blocked".

If the current state is "running" and the event is "timeout", the new state should be "ready".

If the current state is "blocked" and the event is "unblock", the new state should be "ready".

If the current state is "ready" and the event is "dispatch", the new state should be "running".

**[07 marks]**

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| Solution *[copy your code solution and output below, adjust the font accordingly]* |
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**Question No 02:**  Suppose you need to create a shell script that checks whether a given file exists. If the file exists, the script should print a message saying that the file exists, and if the file does not exist, the script should print a message saying that the file does not exist. Write a command in the shell script to achieve this.

**[05 marks]**

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| Solution *[copy your code solution and output below, adjust the font accordingly]* |
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**Question No 03:**  Suppose you are working on a program that uses shared memory to share an integer value between two processes. You need to write a program in C that creates a shared memory segment, sets an initial value for the shared integer, and then allows two child processes to access and modify the value.

Write a program in C that creates a shared memory segment, sets the initial value of the shared integer to 0, and forks two child processes. Each child process should increment the value of the shared integer by 1, and then print the new value of the shared integer. The parent process should wait for the child processes to finish, and then print the final value of the shared integer.

You may use the **shmget, shmat, shmdt**, and **shmctl** functions to work with shared memory in C.

**Note:** You can assume that the shared memory segment will be large enough to hold an integer value.

**[08 marks]**

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| Solution *[copy your code solution and output below, adjust the font accordingly]* |
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