Sir Syed University of Engineering & Technology
Faculty of Electrical & Computer Engineering
Department of ____Computer Engineering_____

Online End Semester Examinations (Spring 2021)

Course Code with Title	**CE-401: Parallel & Distributed Computing**	**Program**	BS (Computer Engineering)
Instructor	**Saba Ahsan, Sana Alam & Rabia Siddiqui**	**Semester**	7th
Start date & Time	June 14, 2021 at 12:00 PM	**Submission Deadline**	June 14, 2021 at 5:00PM
Maximum Marks	50		
Students must meet their submission deadline as there is no re-take or re-attempt after the deadline.			

IMPORTANT INSTRUCTIONS:

Read the following Instructions carefully:

- All Questions carries equal marks
- Attempt All Questions on MS-Word. Font theme and size must be Times New Roman and 12 points respectively. Use line spacing 1.5.
- You may provide answers HANDWRITTEN. The scanned solution must be submitted in PDF file format (Use any suitable Mobile Application for Scanning)
- For Diagrams, you can use paper and share a clear visible snapshot in the same Answer Sheet.
- Arrange questions and their subsequent parts in sequence.
- Make sure that your answers are not plagiarized or copied from any other sources. In case of plagiarism, **ZERO** marks will be awarded.
- Provide relevant, original and conceptual answers, as this exam aims to test your ability to examine, explain, modify or develop concepts discussed during the course.
- Recheck your answer before the submission on **VLE** to correct any content or language related errors.
- You must upload your answers via the VLE platform ONLY.

You must follow general guideline for students before online examination and during online examination which had already shared by email and WhatsApp.

This paper has a total of _03__ pages including this title page

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Note for Question 3: Consider your roll numbers as three digits numbers. For e.g. if your roll number is 4, then consider your roll number as 004. If the last digit of your roll number is zero or one, then before performing any calculation add 3 to your roll number. i.e. Roll Number 090 becomes 093. Similarly, Roll Number 081 becomes 084.

Q.No.1	(CLO_1): (Cognitive Level C2, i.e.,**Understanding**) (PLO_1: Engineering knowledge) **(10)**

(a) By comparing the different architectures of multicore processors, **distinguish** which one is more suitable for Core i7 machine & why ?Justify your answer **.** **(04 Marks)**

(b) Gives an example how different Models of parallel system & Levels of Parallelism plays an important role in designing a suitable parallel machine. **(03 Marks)**

(c) Explain in your own words why vector processing supported by several processor architectures in the form of SIMD multimedia extensions. **(03 Marks)**

Q.No.2	(CLO_1): (Cognitive Level C2, i.e., **Understanding**)(PLO_1: Engineering knowledge)(**10**)

(a) Summarize the MIMD computers based on their memory organization. **(05 Marks)**

(b) Defend with some logical reasoning how logical processors plays a vital role in Simultaneous Multithreading (SMT). **(05 Marks)**

Q.No.3	(CLO_2): (Cognitive Level C3, i.e., **Applying**) (PLO_3: Design of Solution) **(10)**

(a) Demonstrate the routes of a 16 * 16 Omega Network with permutation given below.

Π = (1, middle digit of your roll no +2, 5) (2, middle digit of your roll no + 1 ,6) **(05 Marks)**

(b) For k – dimensional hypercube network where k = 4**, construct** and identify all paths between the following two pairs of nodes: First pair: (i) node 1 = 4 bit binary representation of your roll number and node 2 = 4 bit binary representation (mod 5 (your roll number))
Second pair: (ii) node 1 = 4 bit binary representation (mod 3 (your roll number + 3)) and node 2 = 4 bit binary representation (mod 2 (last two digits of your roll number * 2)) **(05 Marks)**
(Note: first three bits start from LSB).

Q.No.4	(CLO_3): (Cognitive Level C4, i.e., **Analyzing**) (PLO_2: Problem Analysis) **(10)**

(a) Alex is going to start an IT based company for which he requires hardware and software resources from a cloud service provider. He also wants security and networking facility as well because the company will be going to provide service to government sectors who would want close proximity to their data. **Analyze** the following parameters:

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- Whether private cloud/ public cloud or hybrid cloud is a good option for the organization.
- Which type of service they require (IaaS, PaaS or SaaS)?
- Suggest best cloud service provider operating in Pakistan (Considering availability, pricing, compute service and storage service). **(05 Marks)**

(b) Suppose Alia is travelling from Pakistan to Dubai and she will be staying at hotel for a week during COVID pandemic. **Select** a real world scenario in which social distancing is mandatory. Provide a complete solution from airport till hotel check in with less paper handling using RFID technology and Internet of Things. **(05 Marks)**

Q.No.5	(CLO_3): (Cognitive Level C4, i.e., **Analyzing**) (PLO_2: Problem Analysis)	**(10)**

(a) Identify and list down the different approaches of distributed operating environment and devise at least one approach which is more applicable nowadays. Relate these approaches to Distributing Operating System functionality domain by comparing AMEOBA,DCE & MOSIX operating system. **(04 Marks)**

(b) Many people feel that the best benefit of utilizing computer cluster is that they can provide expandability & availability as compared to mainframe**. Compare** the real world examples to justify it**.** **(03 Marks)**

(c) On the basis of CUDA Memory hierarchy ,**analyze** how can we say that CUDA improves data manipulation & reduce fetch time. **(03 Marks)**