## **Indian Institute of Technology Patna**

## **Department of Computer Science and Engg**

**CS321: Computer Architecture** 

Total marks: 100

## Instructions

Attempt all the questions. Marks are given in [].

Submit by date: 28 November 2020/ 10:30PM

Submissions must be sent to the following link (Document A1, A2, A3 and A4-Single file) and File, A3.circ (use roll number as the filename);

https://docs.google.com/forms/d/1ikENnCsxOgpmCMti2pEbTym78\_UkljwI26349EFppsg/edit

Submissions must be also uploaded to the following link in a single zip file (use roll number as the filename);

https://u.pcloud.com/#page=puplink&code=vnU7ZUUS5NFPH8t77xfNdTXPY9LSB9F87

Make appropriate assumption if required. Do not send any response to the personal emails of the instructor. If you do so, your paper will not be evaluated.

## **Assignments:**

**A1:** Write a critical analysis report on design strategy of Cache Memory for Computer performance Improvement: including Cache Hierarchy, Cache Associativity and Cache Write Policies: Pros & Cons.

[25 Points]

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**A2:** Explain how to extend the MIPS pipelined processor to handle the j instruction (jump instruction). Give particular attention to how the pipeline is flushed when a jump takes place.

[20 Points]

**A3:** Design an experiment which conveys one of the concepts in CS321. Clearly state the aim of the experiment, method of solving, and solution. Create a logic-sim set up and simulate the same to convey the concept and include screen shots in the assignment file(Also submit \*.circ file; use file name: Rollno A3.circ

[30 Points]

**A4:** Amdahl's law assumes that the problem size is kept constant- by adding more processors the same problem gets solved faster. Assuming a sequential program with appropriate parameters ( with X portion that can be parallelized). Do a case study analysis. Include graphical analysis in your study ( for example number of processors vs. speed up etc.). Include the program that you are writing for the analysis in the answer sheet.

[25 Points]