Computer Science and Engineering Department, SVNIT, Surat
B. Tech. II CSE (3rd Sem) & B. Tech. II CSE (Minor) (3rd Sem)
End Semester Exam: December 2020
Computer Organization (CS201)

Date: 17th Dec. 2020 Marks:15 Section A

Writing Time: 3:30pm - 4:15 pm Uploading Time: 4:15 to 4:30 pm Instructions:

1. Copy from any book or online material or other answer-book is strictly prohibited. There is NO marks for copied work
2. Use your own examples for explaining the theories.
3. Submit Section A before starting the Section B.
4. Timely uploading of each section is mandatory, late receipt will not be considered in any condition/situation (Each section to be uploaded separately).
5. Answers to be hand written on Answer-sheet like pages.
6. Answers must be uploaded in sequential order of the questions.
7. It is compulsory to mention **Admission No. : Question Number** on each page left top corner and **Page Number** on bottom right corner. Also write **Total Number of Pages on first page left top corner clearly**.

Q.1 Answer the following questions: [15]

1. Write your birth date. Perform the multiplication using Booth's algorithm on the number obtained from your birth date. Consider the month as the multiplicand and multiply it by date. Enlist all the steps systematically. Consider the number of bits accordingly. [03]

2. Write your birth date. Perform the division using restoring method on the number obtained from your birth date. Consider the 4 digit year of your birth as dividend and month as the divisor. Enlist all the steps systematically. [03]

3. For a given cache which is directly mapped, there are eight cache blocks (numbered from 0 to 7). Consider that the memory requests arrive in the following order: [04]

   3, 5, 2, 8, 0, 6, 3, 9, 16, 20, 17, 25, 18, 30, 24, 2, 63, 5, 82, 17, 24

   a) Find out and list the memory blocks that will not be a part of cache after completing the entire sequence.

   b) Calculate hit ratio.

   c) Calculate miss ratio.

4. The logical address space in a computer system consists of 128 segments. Each segment can have up to 32 pages of 4K words in each. Physical memory consists of 4K blocks of 4K words in each. Formulate the logical and physical address formats. [03]

5. A 36-bit floating point binary number has eight bits plus sign for the exponent and 26 bits plus sign for the mantissa. The mantissa is a normalized fraction. Numbers in the mantissa and exponent are in signed-magnitude representation. With the help of calculations, show what are the largest and smallest positive quantities that can be [02]

represented, excluding zero?

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