Date: 30th Sept 2019   Time: 11:00 hrs to 12:30 hrs   Max Marks: 30

Instructions:
1. Write your B. Tech. Admission No./Roll No. and other details clearly on the answer books while write your B. Tech. Admission No. on the question paper, too.
2. Assume any necessary data but give proper justifications.
3. Be precise and clear in answering the questions.

Q. 1 Answer the following [Any Three]:   **[06]**

(a) Enlist the different information about the processor, the compiler is required to know.

(b) Enlist the architecture type according to the storage and write which one is used in current general purpose machines.

(c) Enlist the memory organizations type according to the most of significant bytes on the memory address and also mention one processor for each type.

(d) Write one of performance measure using clock cycle time and also enlist possible ways to improve the performance with respect to clock cycle time.

Q. 2 For the given 'c' program segment, answer the following:

S1=1;   (a) Write MIPS instructions by considering registers: $S1 for variable S1 and $S0 for   **[05]**

if (S1 = = 0)   base address of Array A.

   A [2] = S1;   (b) Explain the addressing mode for anyone address sequence changing instruction used   **[04]**

else   in your translation and show the target address calculation with necessary

   A [2] = 0;   information, considering that MIPS code is stored on the address 80000.

OR

For the corresponding MIPS instruction for S1=1, with the help of diagram show the single cycle processor data path with the necessary components and control signals.

Q. 3 Explain which mode of transfer is better between programmed I/O and interrupt initiated I/O. Justify your   **[05]**
answer.

OR

Explain in detail various methods of asynchronous data transfer.

Q. 4 A 36-bit floating point binary number has eight bits plus sign for the exponent and 26 bits plus sign for the   **[05]**
mantissa. The mantissa is a normalized fraction. Numbers in the mantissa and exponent are in signed-magnitude representation. What are the largest and smallest positive quantities that can be represented, excluding zero?

Q. 5 Perform the following division operation on binary numbers and show the contents of various registers at   **[05]**
each step: 0111000000 by 10001.

OR

Show step-by-step multiplication process using Booth's algorithm when the following binary numbers are multiplied. Assume 5-bit registers that hold signed numbers: (+15) × (-13).

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