Total No. of Questions—**8**]　　　　　　[Total No. of Printed Pages—**3**

Seat No.	

[5668]-202

S.E. (I.T.) (Sem. I) EXAMINATION, 2019

COMPUTER ORGANIZATION AND ARCHITECTURE

(2015 PATTERN)

Time : Two Hours　　　　　　　　　　**Maximum Marks : 50**

N.B. :— (*i*) Neat diagrams must be drawn wherever necessary.

　　　(*ii*) Figures to the right indicate full marks.

　　　(*iii*) Assume suitable data, if necessary.

1. (*a*) A benchmark program is run on a 40 MHz processor. The executed program consists of 1,00,000 instruction executions, with the following instruction mix and clock cycle count.

Instruction Type	Instruction Count	Cycles Per Instruction
Integer Arithmetic	45000	1
Data Transfer	32000	2
Floating Point	15000	2
Control Transfer	8000	2

　　　Determine the effective CPI, MIPS rate and execution time for this program. [6]

　(*b*) What are addressing modes ? State with example any *three* addressing modes used in the processors. [6]

P.T.O.

Or

2. (*a*) Using non-restoring algorithm, divide the following unsigned numbers : [6]

Dividend = 1101

Divisor = 0011

(*b*) Draw and explain instruction cycle state diagram. [6]

3. (*a*) Explain Hardwired control unit with suitable block diagram. [6]

(*b*) A set associative cache consists of 64 lines divided into four line sets. Find various field sizes in memory address. Given that main memory contains 4 k blocks of 128 words each. [7]

Or

4. (*a*) What is TLB ? Comment on its need and access by processor in address translation process. [6]

(*b*) Explain single bus organization of CPU with neat diagram. [7]

5. (*a*) Explain with suitable block diagram, architecture of MIPS processor. [6]

(*b*) What are different types of Hazards in pipelined operation of MIPS ? State their causes. [6]

Or

6. (*a*) Explain events of Fetch and Execute Cycle. [6]

(*b*) Explain code reordering with example to remove data hazards in MIPS pipeline. [6]

7. (*a*) What is NUMA ? Draw suitable diagram of NUMA and explain briefly. [6]

(*b*) Explain with suitable diagram simultaneous multi-threading. [7]

Or

8. (*a*) Draw block diagram of Intel Core i7 organization and explain. [6]

(*b*) Write a short note on cluster configuration. [7]