



EXAMINATIONS SEPTEMBER /OCTOBER 2020
SUPPLEMENTARY SEMESTER / GRADE IMPROVEMENT/
RE-REGISTERED CANDIDATES

Program	: B.E. : Computer Science and Engineering	Semester	: IV
Course Name	: Computer Organization	Max. Marks	: 100
Course Code	: CS45(O)	Duration	: 3 Hrs

Instructions to the Candidates:

- Answer any one full question from each unit.

UNIT- I

- List and explain the different data transfer instructions with an example in ARM Processor. CO1 (06)
 - Discuss the following ARM addressing modes with an example: CO1 (08)
 - PC relative addressing mode
 - Immediate pre-indexed addressing mode
 - Scaled Register offset.
 - Write a Recursive procedure that calculates factorial of number using ARM instructions.. CO1 (06)
- Write the instruction format for: CO1 (08)
 - MOV r6, r5, LSR r3
 - MVN r5, r1
 - STR r5, [r3, #120]
 - Illustrate the stack allocation before, during and after the procedure call and also the typical ARM memory allocation for program and data. CO1 (06)
 - Discuss the following ARM addressing modes with an example: CO1 (06)
 - Register offset post indexed addressing mode
 - Immediate offset pre-indexed addressing mode.

UNIT- II

- Perform Multiplication for the number +13 and +11(Multiplier) using sequential circuit binary multiplier. CO2 (05)
 - Write a note on Special values and Exceptions. CO2 (05)
 - Multiply each of the following pairs of signed 2's complement numbers using booth algorithm and bit pairing of the multiplier(Assume A is the Multiplicand and B is the Multiplier) CO2 (10)
 - A=010111 B=110110
 - A=110011 B=101100 .
- Give an Algorithm for Restoring division method. Illustrate the working of the Algorithm for 8/3. CO2 (07)
 - Represent (1259.125)₁₀ in single and double precision IEEE floating point format. CO2 (06)
 - Illustrate the working of CSA with 45 and 63 as the Multiplicand and Multiplier. CO2 (07)

UNIT- III

- | | | | | |
|----|----|--|-----|------|
| 5. | a) | Explain the Clocking Methodology of MIPS Architecture. | CO3 | (06) |
| | b) | Create the portion of Datapath used for fetching the instruction and incrementing the PC. | CO3 | (06) |
| | c) | Explain and draw the datapath which is modified to resolve Hazards via forwarding. | CO3 | (08) |
| 6. | a) | Create a simple datapath for the MIPS architecture that combines the elements required by different instruction classes. | CO3 | (10) |
| | b) | Explain data hazards and discuss the different solutions used to overcome data hazard. | CO3 | (10) |

UNIT- IV

- | | | | | |
|----|----|---|-----|------|
| 7. | a) | Explain the basic structure of a memory hierarchy and also explain Hitrate, Missrate, Hittime and Misspenality. | CO4 | (08) |
| | b) | Assume a cache consists of 8 oneword blocks. Find the number of misses for the following sequence of block addresses
9,54,84,1,55,85,18,2,44,41,69 using the following cache mapping techniques:
i) Direct- mapped ii)Two-way set-associative
iii)Fully associative cache | CO4 | (08) |
| | c) | Define the steps to be taken on an instruction cache miss. | CO4 | (04) |
| 8. | a) | Explain with a neat diagram, the three primary method of achieving higher memory bandwidth to increase the physical or logical width. | CO4 | (08) |
| | b) | Differentiate between direct mapped, Set associative and fully associative. | CO4 | (08) |
| | c) | Define the following:
i) Memory-stall clock cycles using single missrate and misspenality
ii) Read-stall clock cycle
iii) Write stall clock cycle. | CO4 | (04) |

UNIT- V

- | | | | | |
|-----|----|--|-----|------|
| 9. | a) | Explain Reliability and Availability with respect to Service Accomplishment. | CO5 | (06) |
| | b) | Explain the steps that must occur in handling an interrupt and draw the cause and Status register. | CO5 | (10) |
| | c) | Write a short note on Disk Storage. | CO5 | (04) |
| 10. | a) | Describe the three ways to improve MTTF. | CO5 | (06) |
| | b) | Demonstrate how DMA technique is used to transfer the data between I/O devices and memory efficiently. | CO5 | (10) |
| | c) | Discuss two methods that are used to address the I/O devices. | CO5 | (04) |
