

B.E. Computer Science and Engineering 2nd Year 1st Semester Examination 2019**Subject: Computer Organisation****Time:** 3hrs**Full Marks:** 100Answer any **five**Answer all the sub-parts of a question in *adjacent* location

- 1
 - a. With the help of a diagram discuss about the Von-Neumann architecture. 8
 - b. Mention the different steps of a complete instruction execution cycle. 3
 - c. How is branch prediction performed when dealing with microinstruction? 3
 - d. List steps which are followed during compilation process. 3
 - e. What sort of steps need to be followed during context switching? 3

- 2
 - a. Mention the pros and cons of (i) Sign-magnitude, (ii) 2's complement representation of numbers. 4
 - b. Describe the usage of stack in subroutine call. 3
 - c. Pictorially show how stack can be designed using shift registers. 3
 - d. Consider the example: $Z = (A + B) \times (A + B)$; implement this using 2-address, 1-address and 0-address machines respectively. 10

- 3
 - a. Mention few advantages of Micro-programmed Control Unit over Hardwired Control Unit. 2
 - b. Explain the working principle of *Wilkes'* design. Assume 3-bit address fields, and required number of control signals. Consider that the external source provides the starting address of a microprogram stored in the control memory (CM). Keep the facility when control unit can suitably respond to external signals or conditions. 8
 - c. Mention few ways to improve the processor organization. 4
 - d. Discuss how co-processor works. 6

- 4
 - a. Discuss about precise and imprecise exceptions in superscalar processor. 4
 - b. What are the ways to get rid of these? 4
 - c. Illustrate the issues related to data hazard and control hazard (you are expected to discuss about the some problems and corresponding solutions). 12

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| 5 | a. Diagrammatically show the different register organization of CPU. | 5 |
| | b. Discuss about the basics issues related to floating point arithmetic unit. | 5 |
| | c. Define the four requirements to be satisfied by an instruction set. | 4 |
| | d. Describe how bit-sliced ALU works. | 6 |
| 6 | (a) Explain how prefetching and look-up free cache enhances the performance of the system. | 4 |
| | (b) Discuss the cache coherence problem with solution. | 4 |
| | (c) Identify the advantages of interleaving procedure in memory system. | 2 |
| | (d) Explain the functionality of a SRAM cell (circuit diagram is required). | 6 |
| | (e) Illustrate how write-back protocol differs from write-through protocol. | 4 |
| 7 | Discuss about the following (any two) | 2x10 |
| | a. Cache Memory mapping methods | |
| | b. Multiplication OR Division method in Computer | |
| | c. Nanoprogrammed Control Unit | |
| | d. Direct Memory Access | |