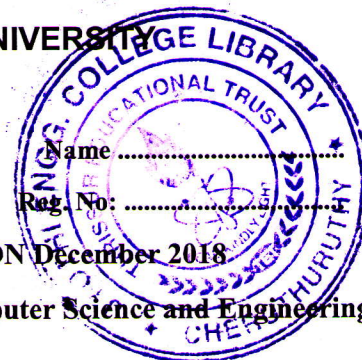# APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
08 PALAKKAD CLUSTER

Q. P. Code : CS-3BC-18-1　　　　　　(Pages: 2)

THIRD SEMESTER M.TECH. DEGREE EXAMINATION December 2018

Branch: Computer Science and Engineering　　Specialization: Computer Science and Engineering

08 CS 7021(C) ADVANCED ARCHITECTURE

Time:3 hours　　　　　　　　　　　　　　　　　　　　　　　　　　Max.marks: 60

Answer all six questions.

Modules 1 to 6: Part 'a' of each question is compulsory and answer either part 'b' or part 'c' of each question.

Q.no.	Module 1	Marks
1.a	What is an ISA? Give examples for 4-, 3-, 2-, 1- and 0- address instruction format.	3

Answer b or c

b	Discuss the design of a datapath for a multi-cycle implementation.	6
c	Differentiate an abstract RTN and a concrete RTN. How do we describe the ISA of a SRC using RTN? Explain.	6

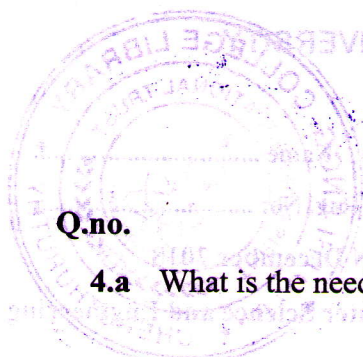| Q.no.	Module 2	Marks
2.a	What is the need for having multi-level caches? Differentiate write through and write around schemes in cache organization.	3

Answer b or c

b	What is write invalidate and write update in a cache organization. Elaborate their working bringing out the advantages and disadvantages of both schemes.	6
c	What is meant by cache coherence? Discuss the working of any one cache coherence protocol.	6

Q.no.	Module 3	Marks
3a	What is ILP? How is it different from thread level parallelism.	3

Answer b or c

b	Discuss the working of Tomasulo's algorithm with an example.	6
c	What is the need for a Reorder Buffer? Discuss the working of Tomasulo's algorithm which uses a Reorder Buffer with an example.	6

Q.no.	Module 4	Marks
4.a	What is the need for multi-core architectures?	3

Answer b or c

b	What are heterogeneous multi-cores? Discuss its working in detail.	6
c	Discuss the various design choices available for designing multi-core architectures bringing out the advantages and disadvantages of each.	6

Q.no.	Module 5	Marks
5.a	What is meant by multi-threading? How is it advantageous?	4

Answer b or c

b	Discuss the basic concepts of threading with emphasis on granularity and concurrency.	8
c	What are the advantages of using threading in application development? Elaborate.	8

Q.no.	Module 6	Marks
6.a	Brief any 4 features of OpenMP with examples.	4

Answer b or c

b	Discuss how synchronization and concurrency is achieved using OpenMP with examples.	8
c	How is OpenMP useful for performance analysis and benchmarking? Discuss.	8