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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION-October2017

B.Tech/ M.TechI Semester

COURSE CODE: 10M11CI114 MAX. MARKS: 35

COURSE NAME: High Performance Computer Architecture

COURSE CREDITS: 3 MAX. TIME: 2Hr

Note: *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

Q1. **[1 x 5 = 5]**

a) Explain the importance of victim cache?
b) What is the advantage of global correlation over predicate bit for dynamic branch prediction?
c) Explain the importance of ISA for RISC and CISC architecture?
d) What do you mean by graining of a program?
e) Explain the importance of benchmark for computer architecture?

Q2. **[Marks 5*2]**

a) Explain various techniques to reduce the miss penalty and improve the performance of memory architecture?

b) You have an L0, L1 data cache, L2 cache, and main memory. The hit rates and hit times for each are: 50% hit rate, 2 cycle hit time to L0. 70% hit rate, 15 cycle hit time to L1. 80% hit rate, 20 cycle hit time to L2. 100% hit rate, 200 cycle hit time to main memory.
   i. Find the access time if the data is found in L2 cache.
   ii. Find the access time if the data is found in L1 cache.
   iii.

Q4. **[Marks 5*2]**

a) Explain the importance of butterfly network over cross bar network and also design butterfly network with 13 nodes and discus various net performance parameters?
b) Explain the importance of scalability in network on chip architecture and discus 3 type of which are scalable in nature and why? Design omega network for 9 nodes?

Q5. **[Marks 5*2]**

a) Explain what type of programs are best suited for CUDA computing? Explain architectural difference between CPU and GPU with example?

b) Design a program to convert RGB image to gray scale using CUDA programming? Consider image size 1024*1024? Find the speedup over sequential and block size and grid size?

Or

Design a program to for merge using CUDA programming? Consider array size 10^6 ? Find the speedup over sequential, complexity analysis and block size and grid size?