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CS8076 GPU Architecture and Programming

PART B & PART C IMPORTANT QUESTIONS

UNIT I

1. Describe in brief about GPU architecture and its components in detail.
2. i) Explain the steps in building CUDA hardware component. (ii) Analyze the information needed to support the hardware component in CUDA.
3. Discuss in detail about different types of memories provided by CUDA.
4. i) Demonstrate in detail about CUDA programming model. ii) Examine in detail about CUDA kernel.
5. (i) Describe the Evolution of different GPU architecture in detail. ii) Identify the major differences between Task and Data parallelism.

Unit II

1. List and explain the different topologies in multi GPU.
2. Explain in detail about memory considerations on a CUDA device
3. i) What is problem decomposition? Explain the various problem decomposition techniques. (ii) Explain the memory spaces on a CUDA device.
4. Explain different memory space available in CUDA along with memory constraint.
5. i) Describe the different libraries provided by CUDA. ii) Describe in detail about image and video libraries.

Unit III

1. Discuss CUDA error handling APIs and explain how they can be used for error checking.
2. Describe in detail about algorithmic issues and memory leaks in CUDA.
3. i) Explain in brief about atomic operations in CUDA. (ii) Explain what are the common problems faced in CUDA.
4. i) How would you summarize in detail about CUDA error handling? ii) Summarize in detail about various kinds of error checking in CUDA.
5. (i) Compare CUDA tools. (ii) Explain the issues regarding CUDA tools. (iii) Write and explain the techniques are employed in finding and solving CUDA error.

Unit IV

1. i) Examine in detail about OpenCL objective with examples. (ii) Describe in detail about OpenCL components
2. What is Kernel? Describe in detail about the features of Kernel programming model
3. i) Analyze the components in OpenCL. ii) Point out the desirable properties of Global Memory.

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4. i) Define OpenCL. With an example program explain the OpenCL program with example. (ii) What are the techniques for creating kernel from source code?

Unit V

1. i) Describe the mathematical foundation for convolution. (ii) Interpret the various applications of convolution.
2. i) Define Fork. And explain the functions of Fork and Join pattern. ii) Describe the function of Data parallelism.
3. Define double buffer and explain the Double buffer version algorithm and Hills and Steele algorithm.
4. Explain how you will apply the sparse matrix multiplication algorithm in detail
5. Analyze the CSR format for sparse matrix.