

GUJARAT TECHNOLOGICAL UNIVERSITY**ME – SEMESTER – II (New)– EXAMINATION – WINTER-2019****Subject Code: 3720221****Date: 22-11-2019****Subject Name: GPU Computing****Time: 02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Discuss CUDA Architecture with suitable diagram. **07**
 (b) What are “thread blocks”, “warps” and “grids”? How are they related? **07**
- Q.2** (a) Differentiate CPU and GPU. **07**
 (b) Define GPU Computing? Explain role of GPU in Gaming with suitable example. **07**
- OR**
- (b) How can measure the computational time of an application developed in CUDA? **07**
- Q.3** (a) What is Heterogeneity? Which one is better: CUDA or Opencl **07**
 (b) Write CUDA code to compute the squares of the first N integers. **07**
- OR**
- Q.3** (a) Discuss Barriers with suitable example. **07**
 (b) Implement matrix multiplication on the CPU and GPU(without using shared memory), and compare their relative performances in terms of GFlop/s and report your performance results. **07**
- Q.4** (a) Discuss Profiling, Profile tools and Performance aspects with suitable example. **07**
 (b) Explain Memory Allocation and Memory copying across devices with suitable example. **07**
- OR**
- Q.4** (a) Discuss Deep Learning with suitable example. **07**
 (b) How can use parallelization of GPUs to boost the computing performance of machine learning applications? **07**
- Q.5** (a) Discuss Synchronous and Asynchronous with respect to stream. **07**
 (b) Implement the 1-D convolution kernel and compare the performance with and without shared memory. **07**
- OR**
- Q.5** (a) Explain Multi-GPU processing with suitable example. **07**
 (b) Discuss Host Function and Kernel Function. **07**
