VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

Digital Assignment - I, Fall Semester 2021-22

Course Code	**: CSE4001**	**Programme: B.Tech**	
Course Name	**: Parallel and Distributed Computing**	**Max. Marks**	**: 10**
Slot	**: B1/B2**	**Class: VL2021220104086 / 4087**	

Answer all the Questions

Question – 01 (4 Marks)

Consider a database with information about the courses offered in a department. Compute the following query to get a desired result

Class ID>="900003" OR Class Category="Computer Science" OR (credits >="2" AND Instructor ID="220387")

Class ID	Class Name	Class Category	Credits	Instructor ID	Classroom
900001	Advanced Calculus	Math	5	220087	2201
900002	Advanced Music Theory	Music	3	220039	7012
900003	American History	History	5	220148	3305
900004	Computers in Business	Computer Science	2	220387	5115
900005	Computers in Society	Computer Science	2	220387	5117
900006	Introduction to Biology	Biology	5	220498	3112
900007	Introduction to Database Design	Computer Science	5	220516	5105
900008	Introduction to Physics	Physics	4	220087	2205
900009	Introduction to Political Science	Political Science	5	220337	3308

Draw any two possible ways of task dependency graph and compute the average degree of concurrency. Comment on the same.

Question – 2 (6 Marks)

Consider a simplified version of bucket-sort. You are given an array A of n random integers in the range $[1...r]$ as input. The output data consist of r buckets, such that at the end of the algorithm, Bucket i contains indices of all the elements in A that are equal to i.

i. Describe a decomposition based on partitioning the input data (i.e., the array A) and an appropriate mapping onto p processes. Describe briefly how the resulting parallel algorithm would work.
ii. Describe a decomposition based on partitioning the output data (i.e., the set of r buckets) and an appropriate mapping onto p processes. Describe briefly how the resulting parallel algorithm would work.
iii. Which of the two decompositions (i or ii) leads to a better parallel algorithm? Should the relative values of n and r have a bearing on the selection of one of the two decomposition schemes?

Note: Stick on deadline – Solve the questions by hand

***** ALL THE BEST*****