ourdiu.com | Shared by Md Fuad Hassan Shiraji

Department of Software Engineering
Daffodil International University
Birulia-1216, Savar, Dhaka.

Student ID: ..... **Section:** ..... **Department:** ..... **Quiz:** .....

Course Code: ..... **Course Title:** ..... **Date:** .....

Answer the following questions: **Time: 35 Minutes** **Total Marks: 15**

1.	You are configuring a Machine Learning training cluster that runs three types of batch jobs: **NLP Models**, **Vision Models**, and **Audio Models**. Let x, y, and z represent the number of active jobs for each category. The cluster must operate at exactly 100% utilization based on the following per-job resource requirements: • **GPU Allocation:** NLP jobs require 4 GPUs each, Vision jobs require 2 GPUs each, and Audio jobs require 1 GPU each. The total available GPUs are 20. • **Memory Allocation:** NLP jobs require 1 TB, Vision jobs require 3 TB, and Audio jobs require 2 TB. The total available memory is 17 TB. • **Network I/O:** NLP jobs consume 2 Gbps, Vision jobs consume 1 Gbps, and Audio jobs consume 3 Gbps. The total network capacity is 20 Gbps. **a) Extract** the data from the scenario to formulate the system of linear equations. *(3 Marks)* **b) Solve** the system to find the required number of active NLP, Vision, and Audio training jobs. *(5 Marks)*	**8**
2.	Given the matrix: $A = [4, 0, 1; -2, 1, 0; -2, 0, 1]$, **a) Determine** all the eigenvalues of matrix A. *(3 Marks)* **b) Find** the eigenvector corresponding to the *maximum* eigenvalue. *(4 Marks)*	**7**

Start writing from here