Data Centre Infrastructure (DCI) Assignment

Test Specification Table

CLO1	Analyze options for Data Centre designs including the requirements, Tier standards, design strategies, and network architecture for building an effective Data Centre. (C4 PLO2)	Group Assignment
CLO2	Justify suitable IT hardware, data center technologies, or space requirements for a data center design. (A3, PLO9)	Individual Assignment - Justification
CLO3	Propose a data center design plan with electrical, mechanical, or other supporting systems. (A3, PLO5)	Individual Assignment – Supporting Design

Question No.	**Topic**	**Question Vs Taxonomy**						**PLO**
		Affective Level						
		1	**2**	**3**	**4**	**5**		
		SQ	**SQ**	**SQ**	**SQ**	**SQ**		
Section A (Group Assignment)	Analyze options for Data Centre designs including the requirements, Tier standards, design strategies, and network architecture for building an effective Data Centre.			40%				9
Section B (Individual Assignment - Justification)	Justify suitable IT hardware, data center technologies, or space requirements for a data center design.			30%				4
Section C (Individual Assignment - Supporting Design)	Propose a data center design plan with electrical, mechanical, or other supporting systems			30%				

SCENARIO

You are the chief data center designer at Equinix, where Equinix is among the top global data center consultants. You have been assigned to design an open-concept data center for any organization globally. The organization can run a data center for its own business service or a data cloud service for business services.

Your team needs to design a completed data center based on your proposal and suggestion according to three-part instructions from Section A, Section B, and Section C. All specifications should be defined and stated to follow a standard organizational framework, and your design should be supported by sound research.

Section A (40%) – Group Work (Main Data Center Design)

PLO9 - Personal Skills

In this section, the team must identify and research the requirements needed for the data center design. The proposed requirements and research are as follows:

a. To describe project scenarios and business needs.

b. The data center design should follow technical goals and strategy guidelines. The number of technical goals and strategies are depending on your design recommendation.

c. To propose types of tiers for the data center.

d. To recommend a complete network solution system for the data center, including network architecture and network topology.

Your research findings and design recommendation will be used in Section B and Section C as supporting evidence to justify the final design.

Section B (30%) – Individual Work (Justification)

PLO4 – Interpersonal Skills

a. To recommend complete IT hardware (switches, servers, storage, etc.) based on the network solution in Section A. All IT hardware suggestions should be actual products from the current market with product specifications and the reason for the selection.

b. To propose a data center floor design that complies with TIA 942 standard zone areas.

Section C (30%) – Individual Work (Supporting Design)

PLO4 – Interpersonal Skills

Based on the proposal solutions specified in Sections A and B, you must propose the most suitable data center components. You must select and evaluate the proper basic data center facility systems that fulfill the proposed solutions and recommendations identified in Sections A and B. The proposed requirements and research are as follows:

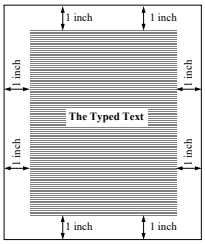
a. To recommend necessary data center components with components architecture design. All component product suggestions should be actual products from the current market with product specifications and the reason for the selection.

b. To propose a Data Center Infrastructure Management (DCIM) system, which includes a Building Management System (BMS) and an Energy Management System (EMS). System management should be explained during the design implementation.

**Students should be able to show their leadership and autonomy skills in the decision-making for the chosen design.*

ASSIGNMENT REQUIREMENTS

1. You are required to complete the assignment in a group of **not more** than **3** members.
2. You are required to build a data center by proposing a design plan with the necessary data center components. Part of the project requires some research on the Data Centre components in the form of analysis, evaluation, and making decisions on choosing the appropriate components.
3. As part of project management, you are required to develop a Gantt chart (project plan) that indicates the activities that are required for the project to be a success.
4. The report has to be well presented and should be *typed*. Submission of reports that are *unprofessional* in its outlook will not fare well when marks are allocated.
5. The report should have a one (1") margin all around the page as illustrated below:



6. Every report must have a *front cover*. Please use the given front cover.
7. **Plagiarism** is a serious offense and will automatically be awarded **zero** (0) marks.
8. **All** information, figures, and diagrams obtained from external sources **must** be referenced using the APA referencing system accordingly.
9. **Section A: Word limit (4000)-** (exclude references, citations & diagrams).
10. **Section B & Section C: Word limit (5000)-** (exclude references, citations & diagrams).
11. **Submission:** Students need to submit all assignments via Moodle where **the group work needs to be submitted into the group work folder** and **individual work needs to be submitted into the individual work folder**.

MARKING RUBRICS (BASED ON SLT)

Section A (40%)					
CLO1: Analyze options for Data Centre designs including the requirements, Tier standards, design strategies, and network architecture for building an effective Data Centre. (C4 PLO2)					
Marking Criteria	**1-2 Fail**	**3-4 (Pass)**	**5-6 (Credit)**	**7-8 (Distinction)**	**9-10 (High Distinction)**
Technical Goals & Strategy with Analysis (10%)	No recommendation of technical goals and strategy. No analysis.	Technical goals are recommended. Minor flaws in the recommendation and brief analysis.	Sufficient recommendation with the justification of technical goals relevant to the scenario and brief analysis.	Good recommendation of technical goals with relevance to the scenario and only analysis without comparison.	Comprehensive recommendation of technical goals with relevance to the scenario and common industry practices and detailed analysis with comparison.
A complete Network Solution and Network Topology (10%)	No network design and topology. No detail in the explanation of network architecture and reasons.	Brief network design and topology. Brief in the explanation of network architecture and no reasons.	Fulfill Network design and topology. Brief in the explanation of network architecture and no reasons.	Fulfill and network design and topology. Explain network architecture and brief reasons.	Comprehensive network design and topology. Detail explain in network architecture and detail reasons.
Marking Criteria	**0-1 Fail**	**2 (Pass)**	**3 (Credit)**	**4 (Distinction)**	**5 (High Distinction)**
Data Center Scenario and Business Concept (5%)	No recommendation Scenario and Business Concept.	Brief explanations and no examples or suggestions.	Explain in detail but no examples or suggestions.	Good recommendation for scenario and business concepts with examples.	Comprehensive recommendation for scenario and business concepts with business strategy and examples.
Tier Selection and evaluation (5%)	No explanation of Tier, selection & reasons, and analysis of Data Center Tiers.	A brief explanation of Tier, selection, no reasons, and no analysis of Data Center Tiers.	Explain in Tier, selection & reasons, and no analysis of Data Center Tiers.	Good explanation of Tier, selection & reasons, and analysis of Data Center Tiers.	A comprehensive explanation of Tier, selection & reasons, and analysis of Data Center Tiers with comparison.
Documentation, Citation & References (5%)	No report/Report with irrelevant contents. Did not select technology and devices/either technology or devices not selected for the design.	The report structure is acceptable, referencing is minimal, and some parts are missing. Technical and academic language needs to be improved. Minimal in-text citations and references were used. Minor issues in the referencing format.	Satisfactory report structure, some referencing, no missing parts, and clarity of language. Enough references and citations in the report. No issue with the referencing format.	Effective report using academic and technical language, fully structured, accurately referenced. A recent source of references was used, with a proper reference list. Limited in-text citations in the report	The outstanding, comprehensive, and clear report, a very high standard of presentation aimed at the right level throughout. Fully referenced. Very good quality references were used, with proper citations and reference lists for all facts and diagrams used
Presentation (5%)	Did not present.	Presented with brief section A's requirements and not well presentation.	Presented with section A's requirements and good presentation.	Presented section A's requirements with good explanation and good presentation.	Presented section A's requirements with excellent explanation and excellent presentation.
Total (Section A)					**/40**
Comments:					

Section B (30%)					
CLO2: Justify suitable IT hardware, data center technologies, or space requirements for a data center design. (A3, PLO9)					
Marking Criteria	**0-2** **Fail**	**3-4** **(Pass)**	**5-6** **(Credit)**	**7-8** **(Distinction)**	**9-10** **(High Distinction)**
IT Hardware Solutions Mapping to the Network Design (switches, servers, storage, etc.) (10%)	No IT hardware map to the network architecture. No product analysis.	IT hardware map to network architecture but no full map to the network architecture. Limited analysis of the IT hardware.	IT hardware full map to network architecture and quite sufficient analysis of IT hardware.	IT hardware full map to network architecture and sufficient analysis of IT hardware.	IT hardware full map to network architecture and excellent analysis of IT hardware.
A data center floor design complies with TIA 942 standard (10%)	Poor consideration of standards for determining IT Space for the Data Center.	Limited consideration of standards for determining IT Space for the Data Center.	Fair consideration of standards for determining IT Space for the Data Center.	Good consideration of standards for determining IT Space for the Data Center.	Excellence consideration of standards for determining IT Space for the Data Center.
Marking Criteria	**0-1** **Fail**	**2** **(Pass)**	**3** **(Credit)**	**4** **(Distinction)**	**5** **(High Distinction)**
Documentation, Citation & References (5%)	No report/Report with irrelevant contents. Did not select technology and devices/either technology or devices not selected for the design.	The report structure is acceptable, referencing is minimal, and some parts are missing. Technical and academic language needs to be improved. Minimal in-text citations and references were used. Minor issues in the referencing format.	Satisfactory report structure, some referencing, no missing parts, and clarity of language. Enough references and citations in the report. No issue with the referencing format.	Effective report using academic and technical language, fully structured, accurately referenced. A recent source of references was used, with a proper reference list. Limited in-text citations in the report	The outstanding, comprehensive, and clear report, a very high standard of presentation aimed at the right level throughout. Fully referenced. Very good quality references were used, with proper citations and reference lists for all facts and diagrams used
Presentation (5%)	Did not present.	Presented with brief section B's requirements and not well presentation.	Presented with section B's requirements and good presentation.	Presented section B's requirements with good explanation and good presentation.	Presented section A's requirements with excellent explanation and excellent presentation.
Total (Section B)					**/30**
Comments:					

Section C (30%)					
CLO3: Propose a data center design plan with electrical, mechanical, or other supporting systems. (A3, PLO5)					
Marking Criteria	**1-2** **Fail**	**3-4** **(Pass)**	**5-6** **(Credit)**	**7-8** **(Distinction)**	**9-10** **(High Distinction)**
Data center components with components architecture design (10%)	No analysis of Data Center Components. Also, poor consideration of mapping to IT Space for the Data Center.	Limited analysis of Data Center Components. Also, limited consideration of mapping to IT Space for the Data Center.	Analysis of Data Center Components is quite sufficient. Also, fair consideration of mapping to IT Space for the Data Center.	Good analysis of Data Center Components. Also, good consideration of mapping to IT Space for the Data Center.	Excellent analysis of Data Center Components. Also, perfect consideration of mapping to IT Space for the Data Center.
Data Center Infrastructure Management (DCIM) (10%)	No analysis of Data Center DCIM. Also, poor consideration of mapping to the Data Center design.	Limited analysis of Data Center DCIM. Also, limited consideration of mapping to the Data Center design.	Analysis of Data Center DCIM is quite sufficient. Also, fair consideration of mapping to the Data Center design.	Good analysis of Data Center DCIM. Also, good consideration of mapping to the Data Center design.	Excellent analysis of Data Center DCIM. Also, perfect consideration of mapping to the Data Center design.
Marking Criteria	**0-1** **Fail**	**2** **(Pass)**	**3** **(Credit)**	**4** **(Distinction)**	**5** **(High Distinction)**
Documentation Citations & References (5%)	No report/Report with irrelevant contents. Did not select technology and devices/either technology or devices not selected for the design.	The report structure is acceptable, referencing is minimal, and some parts are missing. Technical and academic language needs to be improved. Minimal in-text citations and references were used. Minor issues in the referencing format.	Satisfactory report structure, some referencing, no missing parts, and clarity of language. A sufficient number of references and citations in the report. No issue with the referencing format.	Effective report using academic and technical language, fully structured, accurately referenced. A recent source of references was used, with a proper reference list. Limited in-text citations in the report	The outstanding, comprehensive, and clear report, a very high standard of presentation aimed at the right level throughout. Fully referenced. Very good quality references were used, with proper citations and reference lists for all facts and diagrams used
Presentation (5%)	Did not present/Presented but not related to the requirements	Little effort in presenting the work effectively towards goal achievement and requires major improvements	Sufficient presentation of work toward goal achievement	Able to present the work effectively towards goal achievement and require minor improvements	Excellent and effective presentation of work toward goal achievement
Total (Section C)					**/30**
Comments:					

Grand Total (Section A+B+C)	**/100**