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**SCHOOL OF COMPUTING AND ENGINEERING SCIENCES (SCES)**

BACHELOR OF SCIENCE IN INFORMATICS AND COMPUTER SCIENCE

ICS 2203 – ADVANCED NETWORKING

**LAN DESIGN ASSIGNMENT**

**Date:** September 2022 **Time:** **(30 Marks)**

**Instructions:** Answer **ALL questions.**

1. Legacy data center networks utilized a *Three-Tier design* that were enhanced for *resiliency* and concerned with *speed into and out of the data center*, not within it. They worked very well when the majority of traffic moved North-South (from outside the data center in or vice versa). *Discuss in detail and include a sketch* **[10 Marks].**
2. Describe the role of the each of the three layers in your sketch. **[3 Marks].**
3. Explain *two* challenges that the design in **your sketch** poses for modern data centres given the significant increase traffic *within* the data centres. **[4 marks]**
4. To solve the challenges posed by the three-tier design in **your sketch**, the *two-tier architecture* a.k.a *collapsed core* or *spine-leaf architecture* was developed. *Discuss in detail, including advantages and include a sketch* **[10 Marks].**
5. In some cases, where extensive physical or network scalability does not exist, maintaining *separate distribution and core layers* is not required. Explain. **[3 Marks].**