ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
Department of Computer Science and Engineering (CSE)

FINAL EXAMINATION   **SUMMER SEMESTER, 2021-2022**
DURATION: 3 HOURS   **FULL MARKS: 150**

CSE 6493: Cloud Computing

Programmable calculators are not allowed. Do not write anything on the question paper.
Answer **all 6 (six)** questions. Figures in the right margin indicate full marks of questions.

1. a) Differentiate between the scalability and rapid elasticity of cloud service.

   b) What is the adoption rate of platform as a service (PaaS) by large businesses and the government? What advantages will the large organization gain by adopting a PaaS service?

   c) Describe the cloud deployment model. Which strategy would you prefer to implement as the IT manager for a stream service provider? Justify your response with pertinent reasoning.   5 +

2. a) What is the key enabling technology of Cloud computing? Differentiate between type-1 and type-2 hypervisor.   4+

   b) What is Cloud data replication? Why should businesses use distributed cloud data replication?   2+

   c) What is Network Function Virtualization (NFV)? What is the relationship between NFV and Software-Defined Networking (SDN)? Illustrate the NFV architecture with its key components.   1

3. a) What is S3 of Amazon? What advantages does S3 offer? What is a bucket?

   b) Write short notes on google app engine and amazon simple queue service (SQS).

   c) Assume that you are the IT manager of a mid-sized organization. You want to move your online order system to the cloud for one month during the Ramadan. As we know, cloud service providers offer a variety of billing options to their customers, which billing models would you suggest for your business, and why?

4. a) What design considerations must you take while developing a cloud-based application?

   b) Discuss the reference architecture for an e-commerce application using the appropriate diagram.

   c) What benefits does YARN bring in Hadoop 2.0?

5. a) Explain the architecture of Apache Hadoop. Describe the main components of Hadoop.

   b) What is Zookeeper? What are the benefits of Zookeeper?

   c) Imagine that your company uses a distributed data processing system based on Hadoop, deployed on Amazon EC2 instances with all data stored in an HDFS file system running on those same instances. Your colleague argues that, because HDFS maintains three replicas of each block, it is safe to use spot instances instead of on demand instances. Do you agree? Explain your answer

6. a) Discuss the concept of Map Reduce programming model.

b) What are the most pressing concerns with cloud security?

c) Cloud security utilizes a layered technological strategy to safeguard users, devices, data, applications, and the network. Discuss the vulnerabilities that the following cloud deployment layer presents.

    i.   Application and Interface Layer
    ii.   Platform Layer
    iii.   Infrastructure Layer