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

MID SEMESTER EXAMINATION   WINTER SEMESTER, 2020-2021
DURATION: 1 Hour 30 Minutes   FULL MARKS: 75

CSE 4559 / CSE 4749: Introduction to Cloud Computing

There are **3 (three)** questions. Answer **all** of them. Figures in the right margin indicate marks. The examination is **Online and Close Book**. Marks of each question and corresponding CO and PO are written in the brackets.

Write **Student ID** and **Name** top of the first page and write **student ID** and **page no** in every page of the answer script. Submission pdf of the answer script should be named as **Full_Student_ID<space>CourseCode.pdf**

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1 a) Mr X has a host machine that has 128 GB RAM and He is trying to used virtualization and create as many virtual machines as He possibly can. The VMs that He wants to create requires 6 GB RAM but only uses 4 GB RAM. How can Mr X maximize the number of VMs His host machine can support? Calculate the amount of memory that will be saved by Mr X if you used memory overcommit? — 10 (CO2) (PO2)

   b) Traditional IT infrastructure are usually faced with problems such as under provision and low utilization. Illustrate these problems with the help of diagrams. How does Cloud Computing resole such problems in the IT infrastructure? — 10 (CO3) (PO2)

   c) Describe the different Cloud Service Models — 5 (CO1) (PO1)

2. a) What is virtualization? Differentiate between para virtualization and full virtualization. — 5 (CO1) (PO1)

   b) Write short notes on the following. — 10 (CO1) (PO1)
      i.   Cloud Deployment Models
      ii. Issues of Cloud Computing

   c) Discuss the significance of hypervisors in Cloud Computing. — 6 (CO1) (PO1)

   d) How does the different inbound rules add security to your cloud environment in Microsoft Azure — 4 (CO2) (PO2)

3. a) TechMonitor Inc. is a local startup that has been asked by the city to monitor and record near misses and accidents between cars, bicyclists and pedestrians all the time. TechMonitor Inc. is planning to deploy video cameras and dedicated computing at each busy intersection in the city. Since the bandwidth from the intersection to the cloud is limited, TechMonitor Inc. plans to process the streams of data at the intersection to identify near misses and accidents. They will then send the data for just the "interesting" cases to the cloud for storage and potential further analysis. — 10 (CO3) (PO3)

      We know that cloud computing offers various benefits and features to users. For each benefit listed below, indicate whether you believe it would be important to TechMonitor Inc. and describe why

      i.   VM Elasticity
     ii.   No upfront cost
    iii.   Reduced IT maintenance

b) Elaborate on the following type of VM migration. Discuss their downtime and migration duration.

      i.   Stop-and-copy (S-C)
     ii.   Demand-migration (D-M)
    iii.   Iterative precopy (I-P)

9
(CO2)
(PO1)

c) Victor, the old man in your engineering team says that geographically triplicated data centers ensure that if one data center is partitioned from the others, then users connected to the data centers that can communicate will continue to receive service. You, the young intern from IUT, reply that this is not the most important reason for geo-replication in the Cloud Computing services world. Give at least one reason that you might argue is more important than availability during partition and explain how you defend this reason.

6
(CO3)
(PO3)