

Reg. No.



# MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

## III SEMESTER MCA

END SEMESTER EXAMINATIONS, JANUARY - 2021

SUBJECT: CLOUD COMPUTING [MCA 5027]

REVISED CREDIT SYSTEM

(04/01/2021)

Time: 3 Hours

MAX. MARKS: 50

### Instructions to Candidates:

- ❖ Answer **ALL FIVE FULL** questions.
- ❖ Missing data may be suitable assumed.

1A.	Discuss the process for selection of cloud computing deployment and service model in an organization.	5
1B.	Compare Cloud Computing, Cluster Computing and Grid Computing.	3
1C.	List out the various differences between traditional Distributed computing system and cloud computing system.	2
2A.	What is virtualization in cloud computing? Outline the characteristics of Data Virtualization and Network Virtualization.	5
2B.	Discuss the characteristics of Platform as a Service and Software as a Service.	3
2C.	List out any four behavioral law of cloudonomics.	2
3A.	Explain the different levels of virtualization based on its implementation types.	5
3B.	Discuss the basic security model and the type of attacks in the cloud environment.	3
3C.	How does Service-Level Objective (SLO) help define the Service-Level Agreement?	2
4A.	Explain the implementation and working mechanism of the two major techniques used to depict the Multiple - Instruction, Multiple Data (MIMD) systems.	5
4B.	Briefly explain the taxonomy of the Virtualization techniques.	3
4C.	What are the expected system issues of running a parallel program in cloud data centers?	2



5A.	<p>A company named "CURE Health Tech. Pvt. Ltd." provides a cloud service "AROGYA" for e-healthcare services. To access this service, the company implemented a <i>smart card + password</i> authentication named 'Protocol X', a user can login only if they are having registered smart card and valid password.</p> <p>The password change phase of the 'Protocol X' allows the user to change his/her password and the steps are given below:</p> <ol style="list-style-type: none"> <li>The user inserts the smart card into the reader and requests to change the password.</li> <li>User chooses the new password <math>PW_i^{new}</math> and submits it along with the old password <math>PW_i</math>.</li> <li>The smart card computes the authentication credentials and updates in the database.</li> </ol> <p><b>The possible vulnerability of the protocol 'X' has been discussed below:</b></p> <p>The password change phase of the protocol does not verify the correctness of the old password. An attacker can take the user smart card in his absence and invoke the password change phase by inputting an arbitrary password in place of the original password <math>PW_i</math> and a new password.</p> <p><b>Based on the vulnerability discussion, Identify the security attack on the protocol 'X'. Also, explain the nature and impact of the identified attack on the cloud system.</b></p>	5
5B.	Explain the Iterative MapReduce programming model using Twister	3
5C.	Discuss the security challenges in cloud computing environment based on state-of-the-art Cloud Computing Security Taxonomies under the different categories.	2