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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VI - THEORY EXAMINATION (2025 - 2026)

Subject: BigData

Time: 3 Hours

Max. Marks: 100

General Instructions:

IMP: Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of **three Sections -A, B, & C**. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A

20

1. Attempt all parts:-

- (1.1) Which of the following is not a property of cloud computing? (CO1, K1) 1
- (a) virtualization
 - (b) composability
 - (c) scalability
 - (d) all of the mentioned
- (1.2) Point out the wrong statement. (CO1, K1) 1
- (a) Azure enables .NET Framework applications to run over the Internet
 - (b) Cloud Computing has two distinct sets of models
 - (c) Amazon has built a worldwide network of datacenters to service its search engine
 - (d) None of the mentioned
- (1.3) Recognize Hadoop core components (CO2,K2) 1
- (a) HDFS & MapReduce
 - (b) CPU & RAM
 - (c) OS & DBMS
 - (d) Compiler & Linker
- (1.4) Compare scaling out in Hadoop (CO2,K2) 1
- (a) Vertical scaling
 - (b) Horizontal scaling
 - (c) Memory scaling
 - (d) CPU scaling
- (1.5) _____ is a programming model designed for processing large volumes of data 1

in parallel by dividing the work into a set of independent tasks. (CO3, K1)

- (a) Hive
 - (b) MapReduce
 - (c) Pig
 - (d) Lucene
- (1.6) Hadoop I/O comes with a set of _____ for data I/O. (CO3, K1) 1
- (a) methods
 - (b) commands
 - (c) classes
 - (d) none of the mentioned
- (1.7) Statements which best describes federated services in the cloud(CO4,K2) 1
- (a) Federated services refer to services that are distributed across multiple cloud providers.
 - (b) Federated services refer to services that are provided by a single cloud provider but accessed by multiple organizations or domains.
 - (c) Federated services refer to services that are managed by a consortium of cloud providers who work together to provide a common set of services.
 - (d) Federated services refer to services that are provided by a cloud provider and accessed by a single organization
- (1.8) Select the advantage of using VirtualBox over installing a second operating system on a separate physical computer (CO4,K2) 1
- (a) It allows for easier switching between operating systems
 - (b) It is more cost-effective
 - (c) It reduces the need for additional hardware
 - (d) All of the above
- (1.9) Cloud IAM is a _____ service in GCP? [CO5,K2] 1
- (a) Computing service
 - (b) Network service
 - (c) Identity and security
 - (d) Management tools
- (1.10) Which of the following services is responsible for executing automatic transactions and provide features to work with a rich set of queries? (CO5, K2) 1
- (a) Google cloud data store
 - (b) Google Cloud SQL
 - (c) Google BigQuery
 - (d) Data Analytics

2. Attempt all parts:-

- (2.1) Write some uses of Big Data analytics. (CO1, K1) 2
- (2.2) Identify map phase operation (CO2,K2) 2
- (2.3) Name any two compression formats used in Hadoop. (CO3, K2) 2
- (2.4) Name the levels of cloud federation.(CO4,K2) 2

(2.5)	Discuss about BigQuery. CO5, K2	2
SECTION-B		30
Answer any <u>one</u> of the following:-		
(3.1)	Differentiate between Parallel and Distributed computing. (CO1, K4)	6
(3.2)	Define SAS, Apache Spark and Tableau Public. (CO1, K1)	6
Answer any one of the following:-		
(3.3)	Evaluate MapReduce framework design (CO2,K4)	6
(3.4)	Evaluate YARN architecture (CO2,K4)	6
Answer any one of the following:-		
(3.5)	Define Data structure .Explain file-based data structures. (CO3, K2)	6
(3.6)	Explain the tools for Data Serialization. (CO3, K2)	6
Answer any one of the following:-		
(3.7)	Explain the steps to create GCP account.(CO4,K2)	6
(3.8)	Describe federation and levels of federation in detail (CO4,K2)	6
Answer any one of the following:-		
(3.9)	Discuss virtual network also explain Virtual Private cloud concept. (CO5, K2)	6
(3.10)	Explain all the topologies. How this topology concept related in VPC? (CO5, K3)	6
SECTION-C		50
4. Answer any <u>one</u> of the following:-		
(4.1)	Discuss- (A) Distributed System (B) Mainframe computing (C) Virtualization (D) Web 2.0 (E) Utility Computing. (CO1, K2)	10
(4.2)	Explain in detail about the cloud computing evolution and draw its proper diagram? (CO1,K2)	10
5. Answer any <u>one</u> of the following:-		
(5.1)	Compute data replication in HDFS (CO2,K3)	10
(5.2)	Analyze Hadoop ecosystem tools integration (CO2,K3)	10
6. Answer any <u>one</u> of the following:-		
(6.1)	Sketch and explain the components of HDFS architecture in detail. (CO3, K2)	10
(6.2)	How does Namenode handles Datanode failure in HDFS? Briefly explain the functions of block? (CO3, K1)	10
7. Answer any <u>one</u> of the following:-		
(7.1)	Explain the infrastructure overview of the Google Cloud Platform (GCP). How does it support scalable and reliable cloud services? Illustrate with examples.(CO4,K3)	10
(7.2)	Describe different services provided by various SaaS providers.(CO4,K2)	10
8. Answer any <u>one</u> of the following:-		
(8.1)	Define IP Address. Explain Classification of its classes. (CO5, K3)	10
(8.2)	Define Routing. Also Explain Router Table concept. (CO5, K3)	10