(3 Hours)   Max. Marks: 80

N.B.: (1) Question No. 1 is **compulsory**.

(2) Attempt any **Three** questions out of remaining **Five** questions.

(3) **Figures** to the **right** indicate **full** marks.

(4) Assume suitable data if **necessary**.

Q.1 Answer the following: [20]

A) Explain the role and effect of damping factor (teleportation) in PageRan computation.

B) Agility is a NoSQL business driver. Justify.

C) Give the updating buckets approach of DGIM algorithm.

D) Find Cosine Distance between the d1 and d2 vectors.

Index	1	2	3	4	5	6	7	8	9	10
d1	5	2	1	0	0	0	0	1	3	7
d2	5	2	1	0	0	1	2	2	0	2

Q.2 A) List the different NoSQL data stores. Explain any two with diagram.   [10]

Q.2 B) Write steps of Girvan-Newman Algorithm. Explain clustering of Social-Network Graphs using GN algorithm with example?   [10]

Q.3 A) Explain Flajolet Martin Algorithm with example.   [10]

Q.3 B) Distinguish the following: [10]

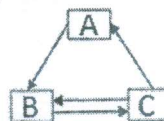i) DBMS and DSMS

ii) PCY, Multistage and Multihash

Q.4 A) List Relational-Algebra Operations. Explain any two using MapReduce.   [10]

Q.4 B) Compute Efficient PageRank with the damping factor d = 0.8 for web.   [10]

Q.5 A) What are different recommender systems. Explain any one with example.   [10]

Q.5 B) Define Hub and Authority. Compute Hub and Authority scores for web.   [10]

Q.6 Answer the following: [20]

A. Core Hadoop Components

B. CURE Algorithm

C. SON Algorithm and MapReduce

D. Matrix-Vector Multiplication by MapReduce

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Q.P.Code: 40003

(3 Hours)   [Total Marks: 80]

N.B.: (1) Question **No.1** is **Compulsory**.
    (2) Attempt **any three** questions from **remaining** questions.
    (3) Assume **suitable** data wherever required but **justify** the same.
    (4) **Figures** to the **right** indicate **full marks**.
    (5) Answer to each new question to be started on a **fresh page**.

1. (a) Elaborate the steps involved in simulation study. Why is it necessary to have program and process documentation? **(10)**

   (b) The sequence of numbers 0.63, 0.49, 0.24, 0.89, and 0.71 has been generated. Use the Kolmogorov-Smirnov test with $\alpha = 0.05$ to determine if the hypothesis that the numbers are uniformly distributed on the interval [0, 1] can be rejected. Use $D_{0.05, 5} = 0.565$. **(10)**

2. (a) A firm sells bulk rolls of newsprint. The daily demand is given by the following probability distribution: **(10)**

Daily Demand (Rolls)	3	4	5	6
Probability	0.20	0.35	0.30	0.15

Lead time is a random variable given by the following distribution:

Lead Time (Days)	1	2	3
Probability	0.36	0.42	0.22

Determine the lead-time demand for 5 cycles of simulation. Random digits for lead time and demand are as follows:

R.D. for Lead Time	46	75	86	27	63				
R.D. for Demand	4	5	4	5	6	3	4	4	6	4

   (b) Draw the flowchart for arrival and departure event. Compare event-scheduling, process interaction and activity scanning algorithms. **(10)**

3. (a) Ace Heating and Air Conditioning service finds that the amount of time a repairman needs to fix a furnace is uniformly distributed between 1.5 and 4 hours. **(10)**
     (i) Find the probability that a randomly selected furnace repair requires more than 2 hours.
     (ii) Find the probability that a randomly selected furnace repair requires less than 3 hours.
     (iii) Find the mean and standard deviation.

   (b) The number of customers arriving at Costa Coffee is Poisson distributed with mean 4. Generate Poisson variate. Use random numbers 0.5389, 0.0532, 0.3492 in sequence. **(10)**

4. (a) Given the following data for utilization and time spent in system for the Able – Baker carhop problem. Calculate the overall point estimators, standard error and 95% confidence interval for the same. Given $t_{0.025, 3} = 3.18$ **(10)**

Run r	1	2	3	4
Able's Utilization ρ_r	0.808	0.875	0.708	0.842
Average system time w_r (mins)	3.74	4.53	3.84	3.98

   (b) What do you understand by calibration and validation of models? How can one increase the face validity of a model and validate the model assumptions. **(10)**

[TURN OVER

5. (a) Customers arrive at random to the passport center at a rate of 40 customers per hour. (10)
        Currently, there are 20 clerks, each serving 4 customers per hour on the average.
        Estimate the average utilization of a server and the average number of busy servers.
        Can we decrease the number of servers?
    (b) Describe briefly Queueing, Inventory and Reliability systems. (10)

6.   Write short notes on (**any two**): (20)
    (a) Multivariate and Time Series Input Models
    (b) Areas of applications of simulation
    (c) Initialization bias in steady state simulation
    (d) Simulation of Manufacturing & Material Handling System

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(3 Hours)   **Total Marks:80**

N.B. (1) Question No. 1 is compulsory
      (2) Attempt any three questions out of remaining five.
      (3) Assume suitable data if required.

1. (a) How is quality cost reduced with the use of ERP? Justify your answer.   20
    (b) What is business modeling?
    (c) Define Lead time and Cycle time.
    (d) Explain up-selling and cross-selling with examples.

2. (a) Explain evolution of ERP w.r.t. MRP, MRP II.   10
    (b) Explain ERP's Plant maintenance module and Material's management module. 10

3. (a) What is an enterprise? What is ERP? Give the advantages of ERP. Discuss the 10
         future of ERP systems.
    (b) Explain ERP's Finance module.   10

4. (a) List and explain phases of ERP Implementation.   10
    (b) List the main variants of E-procurement. Also discuss the advantages and 10
         disadvantages of adopting E-procurement.

5. (a) Distinguish between EFT and EDI.   10
    (b) What are the main characteristics of a Decision Support System (DSS)? How is 10
         a DSS different from a MIS?

6.   Attempt any 4   20
    (a) Customer Relationship Management.
    (b) Buy vs. Build for ERP software.
    (c) E-commerce
    (d) Impact of internet on ERP Products.
    (e) Security for ERP systems.

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(3 Hours)
Max. Marks: 80

N.B.: (1) Question No. 1 is **compulsory**.
(2) Attempt any **Three** questions out of remaining **Five** questions.
(3) **Figures** to the **right** indicate **full** marks.
(4) Assume suitable data if **necessary**.

Q.1 Answer the following: [20]
A) List different Functions of Selection operator? List different techniques to implement selection in Genetic Algorithms.
B) What are defuzzification methods in fuzzy logic? Explain any one with example.
C) Compare and contrast: ANN, Fuzzy Logic and GA.
D) What are the different properties of fuzzy sets?

Q.2 A) The characteristics of the laundry load (inputs) include: The actual weight, fabric types and amount of dirt. The washing parameters (outputs) include: amount of detergent, washing time, agitation, water level and temperature. The cleaner laundry, conserving water, and saving detergent, electricity, time and money needs controlling the above different parameters. Give the initial stage of designing a fuzzy control for a hypothetical washing machine. [10]

Q.2 B) Write back propagation algorithm. Explain how it minimizes the error function. [10]

Q.3 A) What are the different types of artificial neural networks? Explain any two with diagram. [10]

Q.3 B) What is associative memory? Explain how the pattern is represented as a key and retrieve the values associated with that pattern. [10]

Q.4 A) Design Hebb net to implement logical AND function? Use bipolar inputs and targets. [10]

Q.4 B) What are Neuro-Fuzzy Systems? Explain different steps in Neuro Fuzzy Hybrid system. [10]

Q.5 A) What is linear reparability? Explain with example why single layer perceptron is not capable of solving linearly inseparable problems. [10]

Q.5 B) Explain McCulloch Pitts neuron model with example. [10]

Q.6 Answer the following: [20]

A. Delta Learning Rule

B. Binary Hopfield Network

C. GA-Fuzzy approach

D. Competitive Learning

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B.E. Sem. VIII (CBSGS) May 2018
SNMR (IT)

[Time: Three Hours]   [Marks: 80]

Note: 1. Question number 1 is compulsory. Solve any three out of remaining.
       2. Draw figure wherever necessary.
       3. Assume suitable data wherever necessary.

1 (a) Consider an application that requires 1TB of storage capacity and performs 4900 IOPS. Application I/O size is 4 kB. As it is business critical application, response time must be within an acceptable range. Specification of available disk drive: Drive capacity = 73 GB; 15,000 rpm; 5 ms average seek time; 40 MB/s transfer rate Calculate the number of disks required?   10

(b) An application that generates 3600 IOPs with 60% reads and 40% writes. Calculate the IOPS generated for RAID level 1, 4 and 6. Also calculate storage efficiency and usable capacity for RAID levels 3, 5 and 6 with number of disks available are 5 and each disk has storage capacity of 120 GB.   10

2 (a) Compare and contrast different RAID levels.   10

(b) Explain benefits Information Lifecycle Management with respect to the challenges of Information Management.   10

3 (a) Explain the components of Intelligent Storage System and its types.   10

(b) Explain FC ports and login types.   10

4 (a) Explain VIA with the help of block diagram.   10

(b) Explain the architecture and implementation related limitations for efficient storage management.   10

5 (a) Explain the storage virtualization challenges..   10

(b) Explain the components and types of Information System.   10

6 Write short notes on: (any four)   20
    a. Business Impact Analysis(BIA)
    b. Zoned Bit Recording
    c. Infiniband
    d. Document Surrogates
    e. Network File System
    f. Document Term Matrix

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