

# CBCS SCHEME

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18SCS21

## Second Semester M.Tech. Degree Examination, June/July 2019 Managing Big Data

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. Explain about Big data analytics. (10 Marks)  
b. Explain about unstructured data and implementing unstructured data management. (10 Marks)

OR

- 2 a. Explain briefly on Web analytics in Big data. (12 Marks)  
b. Explain about crowd sourcing analytics and Mobile business intelligence. (08 Marks)

### Module-2

- 3 a. Explain about Aggregate data models and key value document data models. (12 Marks)  
b. Explain about Schema less databases in detail. (08 Marks)

OR

- 4 a. Explain about distribution models in detail. (12 Marks)  
b. Explain about composing map-reduce calculations. (08 Marks)

### Module-3

- 5 a. Explain about Hadoop streaming and Hadoop pipes in detail. (12 Marks)  
b. Explain about HDFS design and its concepts. (08 Marks)

OR

- 6 a. Explain about file based data structure. (12 Marks)  
b. Explain about Avro. (08 Marks)

### Module-4

- 7 a. Explain detail about anatomy of Mapreduce Job Run. (12 Marks)  
b. Explain about unit test with MR unit in detail. (08 Marks)

OR

- 8 a. Explain about YARN and job scheduling in MapReduce applications. (12 Marks)  
b. Explain about types of MapReduce. (08 Marks)

### Module-5

- 9 a. Explain about Hbase clients and its example. (10 Marks)  
b. Explain about Cassandra data model and its example. (10 Marks)

OR

- 10 a. Explain about Pig data model in detail. (12 Marks)  
b. Explain about Hive QL data in detail and its Queries. (08 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
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18SCS22

## Second Semester M.Tech. Degree Examination, June/July 2019 Advanced Algorithms

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- Describe the asymptotic notations used for running time of an algorithm with examples. (10 Marks)
  - Explain substitution method for solving recurrences. Determine an upper bound on the recurrence i)  $T(n) = 2T(n/2) + n$  ii)  $T(n) = 2T(\sqrt{n}) + \lg n$  (10 Marks)

OR

- Explain the recursion tree method for solving recurrences. Draw recursion tree for the recurrence  $T(n) = T(n/3) + T(2n/3) + cn$  and use the substitution method to verify that  $O(n \lg n)$  is an upper bound for the solution to the recurrence. (10 Marks)
  - Explain Master method for solving recurrences. Use master method and determine which case of the master theorem applies and write down the answer for the following:  
i)  $T(n) = 9T(n/3) + n$  ii)  $T(n) = 2T(n/4) + n^2$  (10 Marks)

### Module-2

- Find the shortest path from the source vertex 'S' to the remaining vertices for the graph shown in Fig.Q.3(a) using Bellman Ford algorithm. (10 Marks)

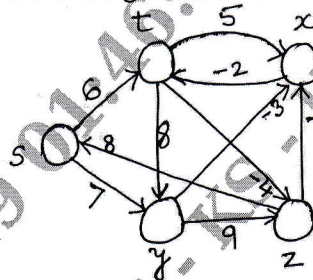


Fig.Q.3(a)

- Write the Johnson's algorithm to solve all pairs shortest path problem for sparse graphs and run the algorithm on the graph given in the Fig.Q.3(b). (10 Marks)

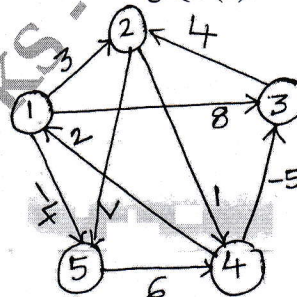


Fig.Q.3(b)

OR

- 4 Write the basic Ford-Fulkerson algorithm for maximum flow problem and apply the algorithm on the graph shown in Fig.Q.4 and find the maximum flow. (20 Marks)

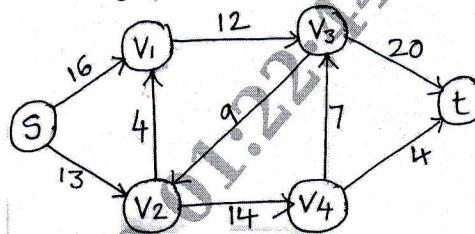


Fig.Q.4

**Module-3**

- 5 a. Write Modular\_Linear\_Equation\_Solver algorithm and explain the operation of this procedure consider the equation  $14x \equiv 30 \pmod{100}$ . (10 Marks)  
 b. Explain the Chinese remainder theorem. Find all integers  $x$  that leave remainders 1, 2, 3 when divided by 9, 8, 7 respectively. (10 Marks)

OR

- 6 a. Write the modular exponential algorithm. Apply this procedure where 'a' is 7 'b' is 560 and  $n = 561$  for  $a^b \pmod{n}$  i.e.  $7^{560} \pmod{561}$ . (10 Marks)  
 b. Explain the RSA public key cryptosystem. Consider an RSA keyset with  $P = 11$ ,  $q = 29$ ,  $n = 319$  and  $e = 3$ . What value of 'd' should be used in secret key. What is encryption of the message  $M = 100$ . (10 Marks)

**Module-4**

- 7 a. Write Rabin-Karp matcher algorithm. Working modulo  $q = 11$ , how many spurious hits does the Rabin-Karp matcher encounter in the text.  $T = 3141592653589793$  when looking for the pattern  $P = 26$ . (10 Marks)  
 b. Write finite automaton matched algorithm. Draw a state transition diagram for the string matching automation that accepts all strings ending in the string "ababaca" and show that operation of the automation on the test  $T = abababacaba$ . (10 Marks)

OR

- 8 a. Write KMP matched algorithm. Compute the prefix function for the pattern "ababaca". (10 Marks)  
 b. Explain Boyer Moore algorithm. Compute the bad match table for the pattern VTU and match the pattern in the text  $T = WELCOME TO VTU$ . (10 Marks)

**Module-5**

- 9 Write a note on probabilistic algorithms and randomizing deterministic algorithms. (20 Marks)

OR

- 10 Explain Monte Carlo and Las Vegas algorithms with examples. (20 Marks)

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18SCS23

## Second Semester M.Tech. Degree Examination, June/July 2019 Cloud Computing

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

### Module-1

- 1 a. With a neat diagram, explain the structure of the 3 delivery models and different types of cloud. (10 Marks)
- b. Write short notes on the following : (10 Marks)
  - i) Cloud Vulnerabilities
  - ii) Ethical issues in Cloud Computing.

OR

- 2 a. Explain the different types of Service offered by AWS which are accessed through AWS Management Console. (10 Marks)
- b. Explain the different Open – Source platforms for Private Cloud. (05 Marks)
- c. Explain the use of energy use and Ecological impact of large scale data centre. (05 Marks)

### Module-2

- 3 a. List and explain the different challenges in Cloud Computing. (06 Marks)
- b. What is a Workflow? Explain the life cycle of the workflow. (08 Marks)
- c. With neat sketch, explain in detail the Zookeeper Co-ordination Service. (06 Marks)

OR

- 4 a. With neat diagram, explain in detail the Map Reduce Programming model. (08 Marks)
- b. What are the different high performance computing that can be performed on the cloud? (06 Marks)
- c. With neat diagram, explain the execution of loosely coupled workloads using the Azure platform. (06 Marks)

### Module-3

- 5 a. What is Virtualization? Explain what is hypervisor and its features with steps to show how it virtualizes CPU and memory. (08 Marks)
- b. Differentiate between Full Virtualization and Para Virtualization. (06 Marks)
- c. Explain with neat diagram, the different types of hypervisor and consideration to be taken while executing privileged and unprivileged instructions. (08 Marks)

OR

- 6 a. Explain the Case study of XEN hypervisor with suitable diagrams. (10 Marks)
- b. Briefly explain the darker side of virtualization. (05 Marks)
- c. Briefly explain how virtualization is done for X86 Architecture. (05 Marks)

### Module-4

- 7 a. List and explain the different policies for Cloud Resource Management. (06 Marks)
- b. Explain with a neat sketch a 2 – level Allocation Architecture based on control theory for cloud. (08 Marks)
- c. Explain in detail the pricing and Allocation Algorithm. (06 Marks)

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OR

- 8 a. Using start – time fair queing Scheduling Algorithm to compute the virtual start – up and the virtual finish time for 2 threads a and b with weight  $W_a = 1$  and  $W_b = 5$ . When the time quantum is  $q = 15$  and thread b blocks at time  $t = 24$  and wakes up at time  $t = 60$ . Plot the virtual time of the scheduler function of the real time. (12 Marks)
- b. Explain how the Resource is managed and Application is scaled dynamically in Cloud. (08 Marks)

**Module-5**

- 9 a. With neat diagram, explain the different surface of Attacks in Cloud Computing Environment. (10 Marks)
- b. Explain the different Security risks faced by Cloud Users. (10 Marks)

OR

- 10 a. Write a note on Service for Adaptive data streaming and Cloud based optimal FPGA synthesis. (10 Marks)
- b. With neat diagram, explain the Virtual Security Services provided by VMM and dedicated security VM. (10 Marks)

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18SCS241

## Second Semester M.Tech. Degree Examination, June/July 2019 Advances in Storage Area Networks

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions, choosing ONE full question from each module.**

### Module-1

- 1 a. With a neat diagram, explain the two types of IT architecture with limitations and advantages. (10 Marks)  
b. With a neat diagram, explain instant copies and space efficient instant copy. (10 Marks)

OR

- 2 a. With a neat diagram, explain the architecture of intelligent disk subsystems. (08 Marks)  
b. Explain the operation of RAID4 and RAID5 level. How RAID5 overcome the limitations of RAID4. (12 Marks)

### Module-2

- 3 a. Explain the three fibre channel topologies with necessary diagram. (10 Marks)  
b. Explain class1, class2 and class3 service classes in fibre channel communication with relevant diagram. (10 Marks)

OR

- 4 a. Discuss the NAS architecture with its advantages. (08 Marks)  
b. Explain Journaling and volume manager with a neat diagram. Explain the realization RAID in volume manager. (12 Marks)

### Module-3

- 5 a. Explain storage virtualization at block level and file level, with neat diagrams. (10 Marks)  
b. Give the advantages of symmetric and asymmetric virtualization. (10 Marks)

OR

- 6 a. Explain symmetric storage virtualization with a neat diagram. (08 Marks)  
b. Explain asymmetric storage virtualization with a neat diagram. (08 Marks)  
c. What are the objectives of storage virtualization? (04 Marks)

### Module-4

- 7 a. Briefly explain the SAN hardware devices. (10 Marks)  
b. Explain fibre channel switches and different types of ports. (10 Marks)

OR

- 8 a. Briefly explain the software components of SAN. (10 Marks)  
b. Write a short notes : i) device drivers ii) host bus adaptors. (10 Marks)

### Module-5

- 9 a. Explain SNMP architecture with necessary diagram. Briefly explain the four operations defined by SNMP for monitoring and configuration of managed devices. (10 Marks)  
b. Explain WBEM architecture with a neat diagram. (10 Marks)

OR

- 10 a. Explain briefly the in band management in fibre channel SAN. (10 Marks)  
b. Briefly explain the two protocol standard for out band management, CMIP and DMI. (10 Marks)

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18SCS253

## Second Semester M.Tech. Degree Examination, June/July 2019 Object Oriented Software Engineering

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. What is software engineering? Explain :  
i) Systems and models ii) Work Products  
iii) Activities, tasks and resources iv) Participants and Roles (10 Marks)  
b. What are the software engineering developments activities? Explain each. (10 Marks)

OR

- 2 a. Explain use case diagram and class diagram in detail. (10 Marks)  
b. Explain the modeling concepts:  
i) Systems ii) Data types iii) Classes iv) event classes (10 Marks)

### Module-2

- 3 a. Explain the functional and nonfunctional requirements in detail. (10 Marks)  
b. How do we manage requirement elicitation? Explain. (10 Marks)

OR

- 4 a. Explain: Analysis object models and dynamic models, entity, boundary and control objects. (10 Marks)  
b. How is mapping use cases to objects with sequence diagrams done? Explain. (10 Marks)

### Module-3

- 5 a. Explain subsystems and classes of system design concepts. (10 Marks)  
b. Explain system design activities. (10 Marks)

OR

- 6 a. Explain mapping subsystems to processors and components in system design activities. (10 Marks)  
b. Explain managing system design. (10 Marks)

### Module-4

- 7 a. Explain Managing Reuse. (10 Marks)  
b. Explain Managing Object Design. (10 Marks)

OR

- 8 a. Explain OCL collection concepts, sets, bags and sequences. (10 Marks)  
b. Explain identifying, missing, attributes and operations. (10 Marks)

### Module-5

- 9 a. What is software maintenance? Explain the factors that mandate change. (10 Marks)  
b. Explain Lehman's law of system evolution. (10 Marks)

OR

- 10 a. Explain types of software maintenance and software maintenance process and activities. (10 Marks)  
b. Explain Reverse Engineering. (10 Marks)

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