

Seat No.	
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**Final Year B.Tech. (Computer Science & Engineering) (Part - IV)**  
**(Semester - VII) (CBCS) Examination, January - 2023**

**ADVANCED DATABASE SYSTEMS**

**Sub. Code : 83858**

**Day and Date : Wednesday, 11 - 01 - 2023**

**Total Marks : 70**

**Time : 10.30 a.m. to 1.00 p.m.**

- Instructions :**
- 1) All questions are compulsory.
  - 2) Assume suitable data whenever necessary.

**Q1) Solve all MCQ's of following: (1 marks each)**

- a) When a participating site  $S_1$  decides to commit the transaction T upon receiving the <prepare T> message from the coordinator, it sends \_\_\_\_\_ message to the coordinator site.
  - i) <prepare T>
  - ii) <commit T>
  - iii) <ready T>
  - iv) <abort T>
- b) A heterogeneous distributed database is which of the following?
  - i) The same DBMS is used at each location and data are not distributed across all nodes.
  - ii) The same DBMS is used at each location and data are distributed across all nodes.
  - iii) A different DBMS is used at each location and data are not distributed across all nodes.
  - iv) A different DBMS is used to each location and data are distributed across all nodes.
- c) Which of the following parallel database architecture is mainly used by distributed database system?
  - i) Shared Memory
  - ii) Shared Disk
  - iii) Shared Nothing
  - iv) Hierarchical

**P.T.O.**

- d) \_\_\_\_\_ refers to the execution of a single query in parallel on multiple processors and disks.
  - i) Interquery parallelism
  - ii) Intraquery parallelism
  - iii) Interdependent parallelism
  - iv) None of the above
- e) A semijoin is which of the following?
  - i) Only the joining attributes are sent from one site to another and then all of the rows are returned.
  - ii) All of the attributes are sent from one site to another and then only the required rows are returned.
  - iii) Only the joining attributes are sent from one site to another and then only the required rows are returned.
  - iv) None of the above
- f) What is the difference between PL/SQL Function and PL/SQL Procedure?
  - i) PL/SQL function may or may not return the value whereas PL/SQL Procedure must have to return the value.
  - ii) PL/SQL Procedure may or may not return the value whereas PL/SQL Function must have to return the value.
  - iii) PL/SQL Function may or may not return the function whereas PL/SQL Procedure must have to return the function.
  - iv) None of the above
- g) How many types of PL/SQL Cursor are there?
  - i) 1
  - ii) 2
  - iii) 3
  - iv) 4
- h) \_\_\_\_\_ is a popular, open-source, sorted ordered column-family store that is modeled on the ideas proposed by Google's Bigtable.
  - i) HBase
  - ii) Hypertable
  - iii) Cloudata
  - iv) None of the above

- i) \_\_\_\_\_ has properties of both Google Bigtable and Amazon Dynamo.
- i) Voldemort
  - ii) Cassandra
  - iii) Riak
  - iv) None of the above
- j) What kind of database MongoDB is?
- i) Graph Oriented
  - ii) Document Oriented
  - iii) Key Value Pair
  - iv) Column Based
- k) \_id in MongoDB is a \_\_\_\_\_ bytes hexadecimal number which assures the uniqueness of every document.
- i) 12
  - ii) 13
  - iii) 14
  - iv) None of the above
- l) Poor data administration can lead to which of the following?
- i) A single definition of the same data entity & Missing data elements
  - ii) Familiarity with existing data
  - iii) All (i), (ii), (iv)
  - iv) Missing data elements
- m) Point out the wrong statement.
- i) BI is a category of database software that provides an interface to help users quickly and interactively scrutinize the results in a variety of dimensions of the data & Data is factual information for analysis
  - ii) BI is a category of database software that provides an interface to help users quickly and interactively scrutinize the results in a variety of dimensions of the data
  - iii) Customer relationship management (CRM) entails all aspects of interaction that a company has with its customer
  - iv) None of the mentioned
- n) Which of the following does not form part of BI Stack in SQL Server?
- i) OIBEE
  - ii) OSSIS
  - iii) OBSAS
  - iv) OBIEE

**Q2)** Solve any two of following: (7 Marks each)

- a) What are parallel systems? Explain parallel database architectures in detail with diagrams.
- b) What is stored procedure in PL/SQL? Give its advantages. Explain in detail, syntax to create stored procedure in PL/SQL.
- c) What is NoSQL? Explain types of NoSQL databases in detail.

**Q3)** Solve any two of following: (7 Marks each)

- a) Explain two phase commit (2PC) protocol in brief. Also explain how 2PC protocol handles failure of a participating site and failure of a coordinator.
- b) Describe oracle sequence. Explain sequence in Oracle with syntax and example.
- c) What is CouchDB? Give difference between MongoDB and CouchDB.

**Q4)** Solve any two of following: (7 Marks each)

- a) Explain data-information in decision making cycle.
- b) What is FireBase?
- c) Differentiate Univariate analysis & Bivariate analysis.

**Q5)** Solve any two of following: (7 Marks each)

- a) What are the desired DBA skills?
- b) What is Business Intelligence? Explain in brief.
- c) What is mathematical model? Explain different classes of model.



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**Final Year B. Tech. (Computer Science and Engineering)**  
**(Semester - VII) (CBCS) Examination, March - 2023**  
**ADVANCED COMPUTER ARCHITECTURE**  
**Sub. Code : 83856**

**Day and Date : Thursday, 15 - 06 - 2023**

**Total Marks : 70**

**Time : 2.30 p.m. to 5.00 p.m.**

- Instructions :**
- 1) All questions are compulsory.
  - 2) Figures to the right indicate full marks.
  - 3) All questions carry equal marks.

- Q1) a)** Choose the correct option representing the relationship among processor cycle  $t_p$ , memory cycletime  $t_m$ , device average access time  $t_d$ . [1]
- i)  $t_d < t_m < t_p$
  - ii)  $t_m < t_d < t_p$
  - iii)  $t_m > t_d > t_p$
  - iv)  $t_d > t_m > t_p$
- b)** The interleaving of CPU and I/O operations among several programs is called \_\_\_\_\_. [1]
- i) Batch processing
  - ii) Time sharing
  - iii) Multitasking
  - iv) Multiprogramming
- c)** In SIMD computer, which of the following scheme is used to partitions the set of PEs into enabled and disable sets? [1]
- i) Routing scheme
  - ii) Broadcasting
  - iii) Network topology
  - iv) Masking scheme
- d)** In pipeline, the computer clock period is defined by [1]
- i) Maximum of time delays of all stages plus time delay of latch
  - ii) Minimum of time delays of all stages plus time delay of latch
  - iii) Average of time delays of all stages plus time delay of latch
  - iv) None of the above

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- e) Ideally, a linear pipeline with  $k$  stages can process  $n$  tasks in \_\_\_\_\_ clock periods [1]
- i)  $k-(n+1)$
  - ii)  $k*(n-1)$
  - iii)  $k+(n+1)$
  - iv)  $k+(n-1)$
- f) In the S access memory organization, which address bits are used to retrieve the information from particular module [1]
- i) Higher  $(n-m)$  bits
  - ii) Lower  $(n-m)$  bits
  - iii) Higher  $m$  bits
  - iv) Lower  $m$  bits
- g) A memory hierarchy takes advantage of [1]
- i) Principle of Locality
  - ii) Principle of Multithreading
  - iii) Principle of Multiaccess
  - iv) None of the above
- h) A cache that has just one block per set (so a block is always placed in the same location) is called \_\_\_\_\_. [1]
- i) direct-mapped cache
  - ii) fully associative cache
  - iii) multilevel cache
  - iv) None of the above
- i) In associative memory, which register is used to enable or disable the bit slices to be involved in the parallel comparison operations across all the words in the associative memory? [1]
- i) Masking register
  - ii) Temporary register
  - iii) Indicator register
  - iv) Comparand register
- j) Which register is used to handle the IF statements in Vector loops? [1]
- i) Vector length register
  - ii) Scalar register
  - iii) Vector mask register
  - iv) None of the above
- k) GPUs have the following type of parallelism that can be captured by the programming environment: [1]
- i) Multithreading
  - ii) MIMD
  - iii) SIMD
  - iv) Instruction-level
  - v) All the above

- l) In GPU computational structure, a Grid consists of [1]  
i) ThreadBlocks ii) Threads  
iii) Registers iv) None of the above
- m) Multiprocessors are computers consisting of \_\_\_\_\_processors. [1]  
i) Tightly coupled ii) Loosely coupled  
iii) Medium coupled iv) None of the above
- n) Symmetric (shared memory) multiprocessors are sometimes called \_\_\_\_\_ [1]  
i) Cache only memory access ii) Uniform memory access  
iii) Non uniform memory access iv) All the above

**Q2)** Solve any two of the following question (7 Marks Each)

- a) List and explain the parallel processing mechanisms in uniprocessor computers. [7]
- b) Explain basic concept of pipelined processors with space-time diagrams. [7]
- c) What is principle of locality? Explain the typical memory hierarchy. [7]

**Q3)** Solve any two of the following questions (7 Marks Each)

- a) Explain how to evaluate the cost of an Integrated Circuit. [7]
- b) Explain Handler's classification of pipeline processor according to levels of processing. [7]
- c) Explain the set associative scheme of placing the block in a cache. [7]

**Q4)** Solve any two of the following question (7 Marks Each)

- a) What is Vector Operand? Explain the classification of vector instructions into four primitive types with example. [7]
- b) Explain the data routing and masking mechanisms for processing elements in SIMD computers. [7]
- c) Explain the basic structure of a centralized shared-memory multiprocessor based on a multicore chip. [7]

**Q5)** Solve any two of the following question (7 Marks Each)

- a) State the three types of pipelined vector processing methods and explain the horizontal vector processing method with example. [7]
- b) Explain NVIDIA GPU Computational Structure. [7]
- c) What is cache coherence protocol? Explain the two classes of cache coherence protocols. [7]





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**Final Year B.Tech. (Computer Science & Engineering)  
(Part-IV)(Semester-VII) (CBCS) Examination, March- 2023  
ADVANCED DATABASE SYSTEMS**

**Sub. Code : 83858**

**Day and Date : Saturday, 17 - 06 - 2023**

**Total Marks : 70**

**Time : 02.30 p.m. to 05.00 p.m.**

- Instructions :** 1) All questions are compulsory.  
2) Assume suitable data whenever necessary.

**Q1) Solve all MCQ's of following:**

**[1 Mark Each]**

- 1) A shared lock allows which of the following types of transactions to occur?
  - a) Delete & Insert
  - b) Read & Insert
  - c) Read
  - d) Update & Insert
- 2) This is an XML-based metalanguage developed by the Business Process Management Initiative (BPMI) as a means of modeling business processes, much as XML is, itself, a metalanguage with the ability to model enterprise data.
  - a) Biz Talk
  - b) BPML
  - c) e-biz
  - d) eb XML
- 3) Performance analysis and tuning is which of the following?
  - a) Undertaken one time at the time of a DBMS installation
  - b) Undertaken one time at the time of the implementation of a new application
  - c) Undertaken as an ongoing part of the managing & backup of a database
  - d) Undertaken as an ongoing part of managing a database
- 4) Patterns that can be discovered from a given database are which type?
  - a) More than one type
  - b) Multiple type always
  - c) One type only
  - d) No specific type

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- 5) Firms that are engaged in sentiment mining are analyzing data collected from?
- a) Social media sites
  - b) In-depth interviews
  - c) Focus groups
  - d) Experiments
- 6) \_\_\_\_\_ is the output of KDD.
- a) Query
  - b) Useful Information
  - c) Data
  - d) Information
- 7) Which of the following applied on warehouse?
- a) Write only
  - b) Read only
  - c) Both a & b
  - d) None of these
- 8) The transaction log includes which of the following?
- a) The essential data of the record & the before-image of a record
  - b) The before and after-image of a record & the after-image of a record
  - c) The before and after-image of a record
  - d) The essential data of the record
- 9) In which of the following architectures memory bus is not a bottleneck?
- a) Shared memory and shared disk
  - b) Shared disk and shared nothing
  - c) Shared memory and shared nothing
  - d) All of the above
- 10) Storing a separate copy of the database at multiple locations is which of the following?
- a) Data Replication
  - b) Horizontal Partitioning
  - c) Vertical Partitioning
  - d) Horizontal and Vertical Partitioning

- 11) Which of the following parallel database architecture is mainly used by distributed database system?
- a) Shared Memory
  - b) Shared Disk
  - c) Shared Nothing
  - d) Hierarchical
- 12) In \_\_\_\_, different queries of transactions execute in parallel with one another.
- a) Inter query parallelism
  - b) Intra query parallelism
  - c) Independent parallelism
  - d) None of the above
- 13) If we are to ensure atomicity, all the sites in which a transaction T executed must agree on the final outcome of the execution. T must either commit at all sites, or it must abort at all sites. To ensure this property, the transaction coordinator of T must execute a \_\_\_\_
- a) Commit
  - b) Commit protocol
  - c) Rollback
  - d) None of the above
- 14) If the speed of a parallel system is N when the larger system has N times the resources of the smaller system, then the speedup is \_\_\_\_
- a) Linear speedup
  - b) Sublinear speedup
  - c) Superlinear speedup
  - d) None of the above

**Q2) Answer any Two:**

**[7 Marks Each]**

- a) Explain data partitioning techniques used in parallel databases. Also give comparison between data partitioning techniques.
- b) What is trigger? Explain in detail, syntax to create trigger in oracle.
- c) Explain document in detail. Also explain MongoDB and CouchDB.

**Q3) Answer any Two:**

**[7 Marks Each]**

- a) Explain how to store data in distributed database systems.
- b) Explain in detail, syntax to create stored procedure in PL/SQL. Write PL/SQL procedure to find factorial of given number.
- c) Explain key/value stores in detail. Also explain cassandra.

**Q4) Answer any Two:**

**[7 Marks Each]**

- a) Explain DA and DBA characteristics.
- b) What is Data Mining? Explain with suitable example.
- c) What is Data validation?

**Q5) Answer any Two:**

**[7 Marks Each]**

- a) Different Database Administration tools.
- b) What is the role of the metadata repository in a data warehouse? How does it differ from a catalog ie relational DBMS?
- c) What is data-mining? Explain the analysis methodologies?



Seat No. 



**Winter Examination Oct/Nov 2023**

**Subject Name:** Bachelor of Engineering\_67541\_83856\_83990 \_ Advanced Computer  
Architecture\_29.11.2023\_10.30 AM To 01.00 PM

**Subject Code: 83856****Day and Date: - Wednesday, 29-11-2023****Total Marks: 70****Time: - 10:30 am to 01:00 pm****Instructions.:**

- 1) All questions are compulsory
- 2) Figures to the right indicate full marks
- 3) Assume suitable data wherever necessary and mention it boldly

**Q.1. Q.1 Solve MCQs. (1 Marks Each)****[14]**

1. Which of the following equation is correct?
  1. Module availability =  $MTTF / (MTTF + MTTR)$
  2. Module availability =  $MTBF / (MTTF + MTTR)$
  3. Module availability =  $MTBF / (MTTF - MTTR)$
  4. Module availability =  $MTTF / (MTTF - MTTR)$
2. In the S access memory organization, total time required to access k consecutive words in sequence starting in module i with a memory access time  $T_a$  and a latch delay of  $\tau$  if  $i+k \leq M$ 
  1.  $\tau + kT_a$
  2.  $\tau + (k-1)T_a$
  3.  $T_a + (k-1)\tau$
  4.  $T_a + k\tau$
3. Increase in volume
  1. decrease the cost
  2. decreases the learning curve
  3. both (A) and (B)
  4. None of the above
4. In SIMD computer, which of the following scheme is used to partitions the set of PEs into enabled and disable sets?
  1. Routing scheme
  2. Broadcasting
  3. Network topology
  4. Masking scheme
5. In ideal case, the maximum throughput that can be achieved with linear pipeline is
  1.  $1/\tau$
  2. f
  3. both (a) and (b)
  4. k

6. Ideally, a linear pipeline with  $k$  stages can process  $n$  tasks in \_\_\_\_\_ clock periods [14]
1.  $k-(n+1)$
  2.  $k*(n-1)$
  3.  $k+(n+1)$
  4.  $k+(n-1)$
7. In \_\_\_\_\_, extra bits are kept in the cache to predict the way, or block within the set of the next cache access.
1. Set prediction
  2. Cache prediction
  3. Way prediction
  4. None of the above
8. Which type of cache miss occur even if you had an infinite sized cache?
1. Compulsory
  2. Capacity
  3. Conflict
  4. None of the above
9. Which technique is used to tackle the problem where the vector is longer than the maximum length?
1. chaining
  2. stride
  3. data mining
  4. strip mining
10. The primary mechanism for supporting sparse matrices is \_\_\_\_\_ using index vectors.
1. Masking operation
  2. gather-scatter operations
  3. stride operations
  4. chaining operation
11. In GPU computational structure, \_\_\_\_\_ is assigned to the multithreaded SIMD Processor.
1. Grid
  2. Thread Blocks
  3. Threads
  4. All of the above
12. Thread level parallelism is utilized by the following software model
1. Parallel processing
  2. Request level parallelism
  3. Multiprogramming
  4. All the above

**13. A memory system is coherent if it**

- 1. Preserve the program order**
- 2. Preserve coherent view of memory**
- 3. Ensures write serialization**
- 4. All the above**

**14. In \_\_\_\_\_ cache coherence protocol, every cache that has a copy of the data from a block of physical memory could track the sharing status of the block.**

- 1. Directory based**
- 2. Snooping**
- 3. Consistency**
- 4. None of the above**

- Q.2. Q2) Solve any two of the following question (7 Marks Each) [14]**
- 1. Explain the functional structure of SIMD array processor.**
  - 2. Define the two states of service with respect to an SLA. Explain the two main measures of dependability.**
  - 3. Explain Handler's classification of pipeline processor according to levels of processing.**
- Q.3. Q3) Solve any two of the following question (7 Marks Each) [14]**
- 1. Draw and explain S-access memory organization.**
  - 2. List and explain six basic cache optimizations in short.**
  - 3. Explain the use of nonblocking caches to increase the cache bandwidth.**
- Q.4. Q4) Solve any two of the following question (7 Marks Each) [14]**
- 1. Explain the architecture of a typical vector processor with multiple functional pipes with neat diagram.**
  - 2. What is Vector Operand? Explain the classification of vector instructions into four primitive types with example.**
  - 3. Explain the components of Processing Element (PE) in SIMD computer.**
- Q.5. Q5) Solve any two of the following question (7 Marks Each) [14]**
- 1. Explain NVIDIA GPU Computational Structure.**
  - 2. Explain the basic structure of a centralized shared-memory multiprocessor based on a multicore chip.**
  - 3. Explain directory based cache coherence protocol.**

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## Winter Examination Oct/Nov 2023

**Subject Name:** B.Tech. CBCS\_67543\_83858\_83993 - Advanced Database Systems\_05.12.2023\_10.30 AM To 01.00 PM

**Subject Code:** 83858

**Day and Date:** - Tuesday, 05-12-2023

**Total Marks:** 70

**Time:** - 10:30 am to 01:00 pm

**Instructions.:**

- 1) All questions are compulsory
- 2) Figures to the right indicate full marks

- Q.1. Choose the correct option. (2 Marks each) [14]**
- i) Which of the following parallel database architecture is mainly used by distributed database system?
- A) Shared Memory
  - B) Shared Disk
  - C) Shared Nothing
  - D) Hierarchical
- ii) \_\_\_\_\_ is a popular, open-source, sorted ordered column-family store that is modeled on the ideas proposed by Google's Bigtable.
- A) HBase
  - B) Hypertable
  - C) Clouddata
  - D) None of the above
- iii)
- The data stored in the database can be queried using.....
- A. XML
  - B.XQuery
  - C.Table
  - D.Records
- iv) What kind of database MongoDB is?
- A) Graph Oriented
  - B) Document Oriented
  - C) Key Value Pair
  - D) Column Based
- v) Which of the following is the preferred way to recover a database after a transaction in progress terminates abnormally?
- A) Rollback
  - B) Rollforward
  - C) Switch to duplicate database
  - D) Reprocess transactions
- vi) If we parallelize the execution of large number of small transactions in a database system, then which of the following would be improved?
- A) Response time
  - B) Rotational latency
  - C) Throughput
  - D) All of the above
- vii) Which of the following applied on warehouse?
- A) write only
  - B) read only
  - C) both a & b
  - D) none of these



- Q.2. Solve any 2 of the following (7 Marks Each) [14]**
- a) What is parallel database system? Explain data partitioning techniques used in parallel databases.**
  - b) How CRUD operation perform in MongoDB. Explain step by step with example.**
  - c) Describe MongoDB. Explain following various commands of MongoDB with syntax and example. A. Use B. Insert() C. Find() D. Save()**
- Q.3. Solve any 2 of the following (7 Marks Each) [14]**
- a) What is Dynamic SQL? State its advantage and disadvantages.**
  - b) Explain parallel architectures.**
  - c) What is CouchDB? Give difference between MongoDB and CouchDB.**
- Q.4. Solve any 2 of the following (7 Marks Each) [14]**
- a) How to maintain security for Database Administration?**
  - b) How the Data Warehouses is useful for Data Analysis ?**
  - c) Enlist and explain Different Mathematical models for decision making**
- Q.5. Solve any 2 of the following (7 Marks Each) [14]**
- a) Describe DBA activities with suitable diagram.**
  - b) Explain Online Analytical Processing ?**
  - c) Explain in details data mining process.**

Seat No. **MAR-APR-2024 SUMMER EXAMINATION****Bachelor of Engineering****Sub. Name: Advanced Database Systems****Sub. Code: 67543/83858/83993****Day and Date: MAY ,09-05-2024****Total Marks: 70****Time: 10:30 AM To 01:00 PM****Instructions:** 1. All questions are compulsory  
2. Draw neat labbelet diagrams wherever necessary**Q1) Solve following MCQ.****[14]**

- i. Which of the following parallel database architecture is mainly used by distributed database system?
- A. Shared Memory
  - B. Shared Disk
  - C. Shared Nothing
  - D. Hierarchical
- ii. The data stored in the database can be queried using. ....
- A. XML
  - B. XQuery
  - C. Table
  - D. Records
- iii. \_\_\_\_\_ is a popular, open-source, sorted ordered column-family store that is modeled on the ideas proposed by Google's Big table.
- A. HBase
  - B. Hyper table
  - C. Cloud data
  - D. None of the above
- iv. What kind of database MongoDB is?
- A. Graph Oriented
  - B. Document Oriented
  - C. Key Value Pair
  - D. Column Based

- v. Which of the following is the preferred way to recover a database after a transaction in progress terminates abnormally?
- A. Rollback
  - B. Roll forward
  - C. Switch to duplicate database
  - D. Reprocess transactions
- vi. \_\_\_\_\_ mean programs can be written as if a database is not distributed for its user.
- A. Transparency
  - B. Distribution Transparency
  - C. Robustness
  - D. None of Above
- vii. Which of the following applied on warehouse?
- A. write only
  - B. read only
  - C. both a & b
  - D. None of these

**Q2)** Solve any 2 of the following (7 Marks Each) **[14]**

1. What is parallel database system? Explain data partitioning techniques used in parallel databases. **[7]**
2. How CRUD operation perform in MongoDB. Explain step by step with example. **[7]**
3. Describe MongoDB. Explain following various commands of MongoDB with syntax and example. A. Use B. Insert() C. Find() D. Save() **[7]**

**Q3)** Solve any 2 of the following (7 Marks Each) **[14]**

1. What is Dynamic SQL? State its advantage and disadvantages. **[7]**
2. Explain parallel architectures. **[7]**
3. What is CouchDB? Give difference between MongoDB and CouchDB. **[7]**

**Q4)** Solve any 2 of the following (7 Marks Each) **[14]**

1. How to maintain security for Database Administration? **[7]**

2. Enlist and explain Different Mathematical models for decision making

[7]

3. How the Data Warehouses is useful for Data Analysis ?

[7]

**Q5)** Solve any 2 of the following (7 Marks Each)

[14]

1. Describe DBA activities with suitable diagram.

[7]

2. Explain Online Analytical Processing ?

[7]

3. Explain in details data mining process.

[7]

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