File Structures VTU Question Paper Set

10IS63

Sixth Semester B.E. Degree Examination, Dec.2016/Jan.2017
File Structures

Time: 3 hrs.

Max. Marks:100

Note: *Answer FIVE full questions, selecting*
at least TWO questions from each part.

PART – A

1 a. What are the three distinct operations that contribute to the total cost of access on disk?
(04 Marks)

   b. Implement UNIX command grep. Display output of your program on standard output.
(06 Marks)

   c. Explain the following functions:
   i) Open a file
   ii) Close a file. (10 Marks)

2 a. What is a record? Explain different methods for organizing records of a file with example.
(11 Marks)
   b. Explain the concept of Inheritance using the I/O buffer class hierarchy. (06 Marks)
   c. Explain the tools available in UNIX for sequential processing of file. (03 Marks)

3 a. Briefly explain with example how spaces can be reclaimed dynamically in fixed length records. (08 Marks)
   b. Explain the different operations required to maintain indexed file. (12 Marks)

4 a. Explain how co-sequential is implemented in a general ledger program. (10 Marks)
   b. Explain with an example, the K-way merge algorithm. (10 Marks)

PART – B

5 a. In detail, discuss paged binary tree. What are its advantages and disadvantages? (10 Marks)
   b. What is B-tree? Explain deletion, merging and redistribution of elements on B-tree. (10 Marks)

6 a. What is indexed sequential access? Explain the block splitting and merging due to insertion and deletion in sequence set with example. (10 Marks)
   b. With a diagram, explain simple prefix B^+ trees and its maintenance. (10 Marks)

7 a. What is hashing? Explain the simple hashing algorithm with example. (10 Marks)
   b. What is collision? Explain the process of collision resolution by progressive over flow technique. (10 Marks)

8 a. Explain the working of extendible hashing in detail. (10 Marks)
   b. Write short notes on:
   i) Pinned records
   ii) Dynamic hashing. (10 Marks)

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Sixth Semester B.E. Degree Examination, June/July 2016
File Structures

Time: 3 hrs.   Max. Marks: 100

Note: *Answer FIVE full questions, selecting*
at least TWO questions from each part.

PART – A

1.   a. Explain briefly the evolution of file structures design. **(05 Marks)**
   b. Suppose it is needed to store a backup of a large mailing list with one million records of 1 hundred bytes record on a 2400 foot reels of 6250 bpi –tape with an internal block gap of 0.3 inch and tape speed is 200 inches per second.
     i) What would be the minimum blocking factor required to fit the file on to the tape?
     ii) If a blocking factor of 50 is used how long would it take to read one block including the gap?
     iii) How long it would take to read to entire file? **(08 Marks)**
   c. Explain the functions of READ, WRITE and SEEK with parameters. **(07 Marks)**

2.   a. What are the different ways of adding structures to a file to maintain the identity of fields ? **(10 Marks)**
   b. Explain the concept of inheritance using I/O buffer class hierarchy. **(06 Marks)**
   c. Define the following terms:
     i) File access method   ii) Meta-data   iii) RRN   iv) Template class. **(04 Marks)**

3.   a. How spaces can be reclaimed from deletion of records from fixed length record file and variable length record file? **(10 Marks)**
   b. What is data compression? Explain different techniques available for data compression. **(10 Marks)**

4.   a. Explain the object-oriented model for implementing co-sequential process. **(08 Marks)**
   b. With example, explain K-Way merge and selection tree for merging large number of lists. **(06 Marks)**
   c. Write a algorithm for heap sorting method for insertion. Show the construction of heap tree for following sequence FDCGHIBEA **(06 Marks)**

PART – B

5.   a. Define a B-tree. Explain the creation of a B-tree, with examples. **(10 Marks)**
   b. What are the properties of B-tree? Explain worst case search. **(06 Marks)**
   c. List the four properties of B* trees. **(04 Marks)**

6.   a. With an example, explain adding a simple index to the sequence set. **(10 Marks)**
   b. Explain how to load a simple prefix B+ tree. **(10 Marks)**

7 a. Suppose that 1000 locations are allocated to hold 700 records in randomly hashed file and that each address can hold 4 records (bucket size = 4). Compute the following values:
   i)   The packing density.
   ii) The expected number of addresses with no records assigned to them by hash function.
   iii) The expected number of addresses with exactly one record assigned.
   iv) The expected number of addresses with one record plus one or more synonyms.
   v)   The expected number of overflow records assuming that only 4 records can be assigned to each home address. **(10 Marks)**

   b. Explain the different collision resolution techniques. **(10 Marks)**

8 a. Explain how extendible hashing works. **(10 Marks)**
   b. Write short notes on:
   i)   Dynamic hashing.
   ii) Storage fragmentation. **(10 Marks)**

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Sixth Semester B.E. Degree Examination, Dec.2015/Jan.2016

File Structures

Time: 3 hrs.

Max. Marks:100

Note: *Answer FIVE full questions, selecting*
at least TWO questions from each part.

PART – A

1 a. What do you mean by file structure? Explain in brief a short history of file structure design.
(04 Marks)
   b. Bring out the differences between physical files and logical files. **(05 Marks)**
   c. Define the following terms :
i) Seek time ii) Rotational Delay iii) Transfer time **(06 Marks)**
   d. With neat sketch, explain UNIX directory structure. **(05 Marks)**

2 a. What do you mean by a record? Explain different methods for organizing records of a file with an example. **(10 Marks)**
   b. Explain the tools available in UNIX for sequential processing of a file. **(04 Marks)**
   c. Write a Pack( ) and unpack ( ) methods in C++ for employee id, employee name, employee designation, employee contact number fields for variable length records. **(06 Marks)**

3 a. Explain the different limitations of binary searching and internal sorting. **(06 Marks)**
   b. Explain the algorithm for keysort. **(06 Marks)**
   c. Explain the different operations required to maintain an indexed file. **(08 Marks)**

4 a. Explain how co – sequential processing is implemented in a general ledger program.
(10 Marks)
   b. Explain how much time merge sort takes to sort a given file. **(10 Marks)**

PART – B

5 a. What do you mean by B – tree? Explain deletion, merging and redistribution of elements on B – tree. **(10 Marks)**
   b. What are paged binary trees? Explain the problems associated with paged binary trees.
(06 Marks)
   c. Mention the four properties of B* trees. **(04 Marks)**

6 a. Define indexed sequential access. Explain the block splitting and merging due to insertion and deletion in a sequence set with example. **(10 Marks)**
   b. Explain simple prefix B$^{\text{I}}$ trees and its maintenance. **(10 Marks)**

7 a. What do you mean by hashing? Explain the simple hashing algorithm with example.
(10 Marks)
   b. What is collision? Explain the process of collision resolution by progressive overflow.
(10 Marks)

8 Write a short note on :
i) Linear Hashing   ii) AVL trees
iii) Strengths and weakness of CD Rom   iv) Pinned Records. **(20 Marks)**

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Sixth Semester B.E. Degree Examination, June/July 2015
File Structures

Time: 3 hrs.

Max. Marks:100

Note: *Answer FIVE full questions, selecting*
at least TWO questions from each part.

PART – A

1 a. Briefly explain History of file structure design. **(06 Marks)**
   b. Explain the sector based data organization in magnetic Disk with a neat diagram. **(08 Marks)**
   c. Explain the organization of data on Nine – Track Tapes with a neat diagram. **(06 Marks)**

2 a. Define Field and Record. Explain the different methods for organizing fields and records of a file, with examples. **(12 Marks)**
   b. Define RRN (Relative Record Number). Explain how does it support direct access with example. **(06 Marks)**
   c. Distinguish between File access and File organization. **(02 Marks)**

3 a. What is redundancy reduction? Explain how Run – Length – Encoding helps in redundancy reduction with an example. **(06 Marks)**
   b. Explain How space can be reclaimed in files, using record deletion and storage compaction technique. **(06 Marks)**
   c. Write an algorithm for searching a record from a file using (i) Binary search (ii) Sequential search. **(06 Marks)**
   d. Define Indexing and its significance in File structures. **(02 Marks)**

4 a. What is co – sequential processing and what are assumptions and components of the model? **(08 Marks)**
   b. Explain the object – oriented model for implementing Co-Sequential process. **(06 Marks)**
   c. Explain the K – Way merge algorithm with an example. **(06 Marks)**

PART – B

5 a. What are the two – major drawbacks with binary search to search a simple sorted index on secondary storage. **(02 Marks)**
   b. Define B – Tree. Show the B – Tree of oder – 4 (four) that result from loading the following sets of keys in order. i] CGJXNSUOAEBHIF ii] CSDAMPIBWNGURKE **(08 Marks)**
   c. With example explain the following operations in B – Tree, with example.
   i) Deletion   ii) Merging   iii) Redistribution. **(10 Marks)**

6 a. What is indexed sequential access? Explain the Block splitting and merging due to insertion and deletion in sequence set with example. **(10 Marks)**
   b. Explain the internal structure of index set blocks. **(10 Marks)**

7 a. Define Hashing? Discuss the various collision resolution techniques with example to avoid collision. **(10 Marks)**
   b. Suppose that 10,000 addresses are allocated to hold 8000 records in a randomly hashed file and that each address can hold one record. Compute the following values.
   i) The packing density for the file
   ii) The expected number of address with no records assigned to them by the hash function.
   iii) The expected number of addresses with one record assigned.
   iv) The expected number of overflow records. **(10 Marks)**

8 a. Write short notes on the following:
   i) Dynamic Hashing ii) Linear Hashing iii) Extendible Hashing. **(12 Marks)**
   b. Explain, How does Extendible Hashing works? **(08 Marks)**

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Sixth Semester B.E. Degree Examination, June/July 2014
File Structures

Time: 3 hrs.   Max. Marks:100

Note: *Answer FIVE full questions, selecting*
at least TWO questions from each part.

PART – A

1   a.   With a neat sketch, explain UNIX directory structure.   **(05 Marks)**
    b.   Differentiate between the physical file and the logical file.   **(05 Marks)**
    c.   Explain the following functions:
      i) Open a file   ii) Close a file   **(10 Marks)**

2   a.   What is a record? Explain different methods for organizing records of a file with example.
                   (11 Marks)
    b.   Explain briefly how to manipulate buffers using classes.   **(09 Marks)**

3   a.   What are the limitations of binary search and internal sorting?   **(08 Marks)**
    b.   Explain the different operations required to maintain indexed file.   **(12 Marks)**

4   a.   Explain how co-sequential processing is implemented in a general ledger program. **(10 Marks)**
    b.   Explain how much time a merge sort takes to sort a given file.   **(10 Marks)**

PART – B

5   a.   What is B-tree? Explain deletion, merging and redistribution of elements on B-trees.
                   (10 Marks)
    b.   Write a note on problem associated with paged binary trees.   **(06 Marks)**
    c.   List the four properties of B* trees.   **(04 Marks)**

6   a.   With an example, explain adding a simple index to the sequence set.   **(10 Marks)**
    b.   Explain how to load a simple prefix B+ tree.   **(10 Marks)**

7   a.   What is Hashing? Explain the three different steps used in a simple hashing algorithm.
                   (10 Marks)
    b.   Briefly explain the different collision resolution techniques by progressive overflow.
                   (10 Marks)

8   Write short notes on:
    a.   Extendible hashing
    b.   Pinned records
    c.   CD-ROM strengths and weaknesses
    d.   K-way Merge   **(20 Marks)**

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Sixth Semester B.E. Degree Examination, Dec. 2013/Jan. 2014
File Structure

Time: 3 hrs.

Max. Marks:100

Note: *Answer FIVE full questions, selecting*
atleast TWO questions from each part.

PART – A

1 a. What is seeking and how is it supported in C++ streams. **(06 Marks)**
   b. Explain the strengths and weaknesses of CD – ROM. **(08 Marks)**
   c. Explain the following :
      i) Physical file
      ii) Logical file
      iii) Open function
      iv) Close function. **(06 Marks)**

2 a. What are the ways in which records can be organized in a file? Explain each with a example. **(10 Marks)**
   b. What are self – describing files? How it is supported in fixed length record structures, explain with an example. **(10 Marks)**

3 a. Explain how to reclaim space n files for fixed length record structures. Also list their merits and demerits. **(10 Marks)**
   b. What is an index? What are the operations performed to maintain an index file. **(10 Marks)**

4 a. Write and explain the procedure to merge two lists consisting of names using co-sequential processing, with example. **(10 Marks)**
   b. What is co-sequential processing? Give assumptions made for the same and what are its components. **(10 Marks)**

PART – B

5 a. Give the formal definition of B –tree properties. **(06 Marks)**
   b. Given the B – tree of order M = 4 as shown in the Fig. Q5(b) below. Inset the keys. I, B, W, N, G, U, R into the B – tree one after the other in a sequence. Also, show the steps for every key inserted, with neat diagrams. **(14 Marks)**
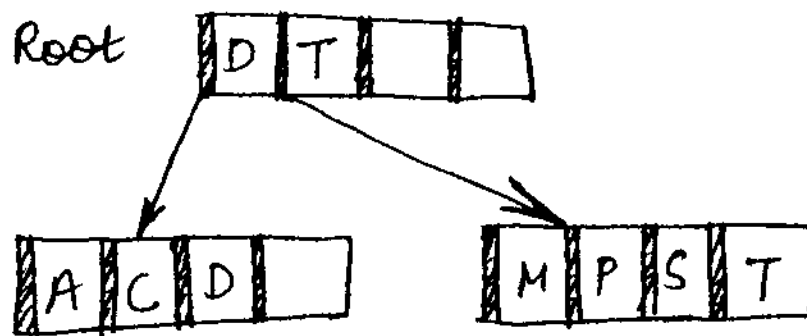

Fig. Q5(b) B – tree with order M = 4.

6 a. Compare B+trees and simple prefix B+trees. (08 Marks)
   b. With a suitable diagram, explain the internal structure of index set blocks. (10 Marks)
   c. What is indexed sequential access? (02 Marks)

7 a. What is hashing? Explain a simple hashing algorithm, with example. (10 Marks)
   b. What is collision? Explain double hashing and chained progressive overflow techniques, with diagram. (10 Marks)

8   Write short notes on :
   a. Extendible hashing performance
   b. Dynamic hashing
   c. Buddy bucket
   d. Trie. (20 Marks)

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Sixth Semester B.E. Degree Examination, June/July 2013
File Structures

Time: 3 hrs.   Max. Marks:100

Note: *Answer FIVE full questions, selecting
at least TWO questions from each part.*

PART – A

1 a. What are file structures? What is the driving force behind the file structure design?
                                                                    (04 Marks)
   b. Explain the functions READ and WRITE with parameters.   **(06 Marks)**
   c. What are the three distinct operations that contribute to the total cost of access on disk?
                                                                    (04 Marks)
   d. Briefly explain the organization of data on Nine-Track tapes with a neat diagram. **(06 Marks)**

2 a. What are the different ways of adding structures to a file to maintain the identity of fields?
      Explain with example.   **(08 Marks)**
   b. Explain the concept of inheritance using the I/O buffer class hierarchy.   **(06 Marks)**
   c. What is RRN? Explain how does it support direct access with example.   **(06 Marks)**

3 a. Briefly explain with example how spaces can be reclaimed dynamically in fixed length
      records.   **(08 Marks)**
   b. What are the limitations of keysort method?   **(03 Marks)**
   c. What are inverted lists? How does it improve the secondary index structure? **(09 Marks)**

4 a. Explain the object-oriented model for implementing co-sequential process.   **(10 Marks)**
   b. With example, explain K-way Merge and selection tree for merging large number of lists.
                                                                    (10 Marks)

PART – B

5 a. In detail, discuss paged binary tree. What are its advantage and disadvantage? **(10 Marks)**
   b. What is B-tree? With example explain the following operations in B-tree:
      i) Deletion; ii) Merging;   iii) Redistribution.   **(10 Marks)**

6 a. What is indexed sequential access? Explain the block splitting and merging due to insertion
      and deletion in sequence set with example.   **(10 Marks)**
   b. Explain simple prefix B⁺ trees and its maintenance, with diagram.   **(10 Marks)**

7 a. What is hashing? Explain the simple hashing algorithm with example.   **(10 Marks)**
   b. Explain any two different collision resolution techniques.   **(10 Marks)**

8 a. Briefly discuss the working of extendible hashing.   **(10 Marks)**
   b. Write short notes on: i) Dynamic hashing;   ii) Storage fragmentation.   **(10 Marks)**

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