CBCS SCHEME

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18IS61

Sixth Semester B.E. Degree Examination, June/July 2023
File Structures

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Differentiate between file structures and data structures. Illustrate the evaluation of file structures. **(08 Marks)**

b. Calculate the space required on the tape if we want to store 1 million 100 bytes records on 7250 bpi tape that has an internal block gap of 0.2 inches and blocking factor of 60. **(06 Marks)**

c. Suppose you are writing a list of names to a text file, one name per write statement. Why is it not a good idea to close the file after every write and reopen it before the next write? **(06 Marks)**

OR

2 a. Illustrate the structure of CD-ROM sector. **(05 Marks)**

b. Write a program to read a series of names one per line standard input and write out those names spelled in reversed order to standard output. Use read IO directions and pipes to do the following:

i) Input a series of names that are typed in from the keyboard and write them out reversed to a file called file 1.

ii) Read the names in file 1, then write them out re-reversed to a file called file 2. **(08 Marks)**

c. Differentiate between constant linear velocity and constant angular velocity. Justify how constant linear velocity is more suitable for audio CD. **(07 Marks)**

Module-2

3 a. How space can be reclaimed from the deletion of records in the variable length records. Illustrate with an example. **(06 Marks)**

b. Discuss the limitation of secondary key index. Explain the linking the list of references technique to overcome the limitation. **(06 Marks)**

c. What is redundancy reduction? Why run length encoding is an example of redundancy reduction? How would we encode the following sequence of hexadecimal byte values? 22, 23, 24, 24, 24, 24, 24, 24, 24, 25, 26, 26, 26, 26, 26, 26, 25, 24. **(08 Marks)**

OR

4 a. Explain the Huffman code algorithm. Generate the Huffman code for CDFFE. **(08 Marks)**

b. What is the difference between internal and external fragmentation? How can compaction effect the amount of internal fragmentation in a file? What about external fragmentation? **(06 Marks)**

c. Write a C++ program on simple index for a file of student objects. Implement add( ) and search( ) function using the index. **(06 Marks)**

Module-3

5 a. Define heap. List the properties of the heap. Build the heap binary tree for the following keys. Show each step clearly. F D C G H I B E A. **(08 Marks)**

b. Explain the merging as a way of sorting of large files on disk. **(08 Marks)**

c. Explain the consequential operations with an example. **(04 Marks)**

OR

6 a. Define B-tree. List the properties of B-tree. Build the B-tree for the given keys. C S D T A M P I B W N G U R K E H O L J Y Q Z F X V. Show each step clearly. **(14 Marks)**

b. Derive the equation for worst case of search depth of B-tree. B-tree of order 512 that contains 1,00,000 keys. Find the maximum depth of the tree. **(06 Marks)**

Module-4

7 a. Illustrate the maintenance of sequence set with an example. **(06 Marks)**

b. Describe the simple prefix B+ tree and its maintenance. **(08 Marks)**

c. List the strength and weakness of B+ trees and B trees. **(06 Marks)**

OR

8 a. Describe file structures that permit each following type of access:
i) Sequential Access only
ii) Direct Access only
iii) Indexed Sequential Access. **(09 Marks)**

b. Explain with a suitable example variable length separator and corresponding index. **(05 Marks)**

c. If the keys EMBRY and FOLKS in the simple prefix in the following Fig.Q.8(c) are deleted from the sequence set node. How the index set in the given diagram is affected by the sequence set deletion.

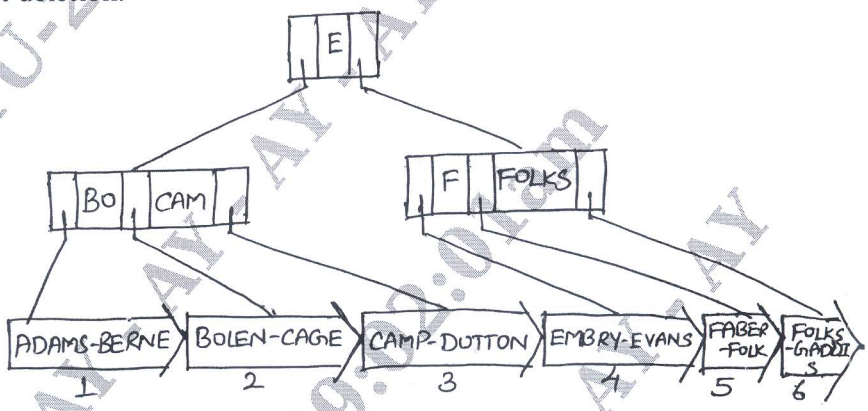

Fig.Q.8(c)

(06 Marks)

Module-5

9 a. Illustrate with suitable diagram dynamic hashing and linear hashing. **(08 Marks)**

b. Explain in detail the working of extendible hashing. **(08 Marks)**

c. Describe space utilization of buckets with suitable example. **(04 Marks)**

OR

10 a. What is hashing? Explain simple hashing algorithm with an example. **(10 Marks)**

b. Suppose that 10,000 address are allocated to hold 8000 records in a randomly hashed files and 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 re-assigned to them by the hash function.
iii) The expected number of address with one record assigned (no synonym).
iv) The expected number or address with one or more record and one or more synonym.
v) The expected number of overflow records. **(10 Marks)**

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