Sixth Semester B.E. Degree Examination, June 2012

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. Implement the UNIX command 'tail – n filename' where n is the number of lines from the end of the file to be copied to the stdout. **(08 Marks)**

b. i) Suppose it is needed to store a backup of a large file with 1 million records of 100 bytes records on a 7250 bpi tape that has an internal gap of 0.2″ and with a blocking factor of 60. Hence calculate the space required on the tape.

ii) If the same file is to be stored on the disk with the following (a record should not span 2 sectors) number of bytes/sector = 512; number of sectors/track= 170; number of tracks/cylinder = 16; number of cylinders = 526; How many cylinder does file require? What is the total capacity of disk? **(06 Marks)**

c. Explain the functions OPEN, READ and WRITE with parameters. **(06 Marks)**

2 a. What are different ways of adding structures to a file to maintain the identity of records? Explain each with an example. **(08 Marks)**

b. What is the advantage of using inheritance for record buffer classes? Explain. **(08 Marks)**

c. Discuss the importance of header records for a record file, with an example. **(04 Marks)**

3 a. Build the Huffman tree and code the input symbols for the following input sequence:

Symbol	a	b	c	d	e	f
Probability	0.1	0.4	0.06	0.1	0.04	0.3

(10 Marks)

b. Discuss the limitations of retrieving the records using combinations of secondary keys. Explain the solution by using "linking the list of reference" technique. **(10 Marks)**

4 a. Explain how spaces can be reclaimed in files. **(06 Marks)**

b. Write an algorithm for heap sorting method. Show the construction of heap tree for following incoming sequence FDCGHIBEA. **(09 Marks)**

c. In consequential processing model, what are the general assumptions and corresponding practical complexities (comments)? List them. **(05 Marks)**

PART – B

5 a. Explain B-Tree methods for search ( ) and insert ( ) with necessary C++ code. **(10 Marks)**

b. Explain the following with respect to B-Tree:
   i) Worst-case search depth
   ii) Redistribution during insertion. **(10 Marks)**

6 a. Explain simple prefix B+ tree. Explain the issues involved in maintenance of such trees.
(10 Marks)

b. Compare and contrast the organization of B− tree, B+ tree and simple prefix B+ trees.
(05 Marks)

c. Discuss the sequences of loading a simple prefix B+ tree. **(05 Marks)**

7 a. Suppose that 1000 addresses are allocated to hold 800 records in a randomly hashed file and that each address can hold one record. Compute the following values:
  i) The packing density
  ii) The expected number of addresses with no records assigned to them
  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 one record can be assigned to each home addresses
  vi) Percentage of overflow records. **(08 Marks)**

b. Discuss any three methods used to avoid collision in hashing techniques. **(12 Marks)**

8 a. Explain the working of extendible hashing. **(10 Marks)**

b. Write short notes on:
  i) Extendible hashing performance
  ii) Dynamic hashing. **(10 Marks)**

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