



Sixth Semester B.E. Degree Examination, June/July 2025

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 structure. (10 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. (10 Marks)

OR

- 2 a. Illustrate the structure of CD-ROM sector. (06 Marks)
- b. Differentiate between constant linear velocity and constant angular velocity. Justify how constant linear velocity is more suitable for audio CD. (08 Marks)
- c. Write a program to read a series of names one per line standard input and write out these names spilled in reverse 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. (06 Marks)

Module-2

- 3 a. What is redundancy reduction? Why run length encoding is example of redundancy reduction? How would you encode the following sequence of hexadecimal byte values?
22, 23, 24, 24, 24, 24, 24, 24, 24, 24, 25, 26, 26, 26, 26, 26, 26, 25, 24. (10 Marks)
- b. Explain Huffman code Algorithm. Generate Huffman code for CDFFE. (10 Marks)

OR

- 4 a. Write a C++ program on a simple index for a file of student objects. Implement add () and Search () function using the Index. (08 Marks)
- b. Discuss limitation of secondary key index. Explain the linking the list of references technique to overcome the limitation. (08 Marks)
- c. Give any 2 differences between Internal and External fragmentation. How can compaction effect the amount of internal fragmentation of a file. (04 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. (10 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. (10 Marks)

OR

- 6 a. Define B Tree. List the properties of B-tree. Build 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. (10 Marks)
- b. Explain the merging as a way of sorting of large files on disk. (10 Marks)

Module-4

- 7 a. Describe the simple prefix B+tree and its maintenance. (10 Marks)
- b. List the strengths and weakness of B+ trees and B trees. (08 Marks)
- c. List any 2 strengths of ordinary Tree. (02 Marks)

OR

- 8 a. Describe file structures that permit following type of access:
i) Sequential Access only
ii) Direct Access only
iii) Indexed Sequential Access. (12 Marks)
- b. Explain with a suitable example variable length separator and corresponding index. (08 Marks)

Module-5

- 9 a. What is hashing? Explain simple hashing with an example. (10 Marks)
- b. Explain in detail Extensible hashing. (10 Marks)

OR

- 10 a. Illustrate with a suitable diagram Dynamic hashing and linear hashing. (12 Marks)
- b. Describe space utilization of buckets with suitable example. (05 Marks)
- c. Give any one way to reduce number of collisions. (03 Marks)

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