

**BCA II Semester
Examination, 2023-24****DATA STRUCTURE & FILE
ORGANIZATION****Paper : I****Time : 2 : 30 Hours]****[Max. Marks : 70**

Note : Attempt any five questions. Each question carries equal marks.

- Q. 1. (a) Convert the following infix expression to its postfix form $(a+b*c/d)-e*f$.
(b) What is Recursion. Explain with program ?
- Q. 2. (a) Write a Short note on Asymptotic Notations.
(b) Define Linked List and Stack with its all types.
- Q. 3. (a) What is height balanced tree ?
(b) Write application of queue with its advantage.
- Q. 4. (a) Construct a binary search tree for the given list of numbers by steps :
56, 45, 67, 12, 11, 48, 34, 20, 78
(b) Distinguish between LIFO and FIFO.

- Q. 5. (a) Discuss quick sort algorithm with example.
(b) Explain different types of data structure.
- Q. 6. Consider the following stack of characters, where STK is allocated $N = 8$ memory cells :
Describe the stack as the following operation take place :

STK : A, C, D, F, K,,,

- (i) POP (STK, DATA)
 - (ii) POP (STK, DATA)
 - (iii) PUSH (STK, L)
 - (iv) PUSH (STK, P)
 - (v) POP (STK, S)
 - (vi) POP(STK, DATA)
 - (vii) PUSK (STK,R)
- Q. 7. (a) Consider building a B – tree of degree 4 that is balanced four way tree where **each node can** hold three data values and have four branches. The values are :
- 1, 5, 6, 2, 8, 11, 13, 18, 20, 7, 9

(b) Explain the following :

- (i) B- tree
- (ii) Sorting
- (iii) Merg
- (iv) Hashing

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