Code No: R1622053 **R16** SET - 1

II B. Tech II Semester Supplementary Examinations, November - 2018
ADVANCED DATA STRUCTERES
(Computer Science and Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1. a) Define external sorting. (2M)
   b) List some applications of hashing. (2M)
   c) What is the maximum height of a binary heap with n nodes? (3M)
   d) What is an extended binary search tree? (2M)
   e) How slow disk access effects search trees? (2M)
   f) Why it is necessary to append an additional blank at the end of every key in a trie that has keys of variable lengths? (3M)

PART -B

2. a) Write and explain external merge sort algorithm. (7M)
   b) Prove that the asymptotic internal processing time of k-way merge is independent of k. (7M)

3. a) What are primary and secondary clustering problems? Suggest open addressing methods to avoid them. (7M)
   b) If n/b is the loading density of a hash table using a uniform hash function h, the derive expressions for the expected number of key comparisons in different overflow handling methods. (7M)

4. a) Write and explain build heap algorithm. Give an example. (7M)
   b) Calculate amortized insertion cost of binomial heaps. (7M)

5. a) Construct Optimal Binary Search Tree for the below case: (7M)
   n=4, (a1, a2, a3, a4) = (10, 15, 20, 25), (p1, p2, p3, p4) = (3, 3, 1, 1) and (q0, q1, q2, q3, q4) = (2, 3, 1, 1, 1)
   b) Compute the worst case height of a red-black tree with n elements. (7M)

6. a) Show that all B trees of order 2 are full binary trees. (7M)
   b) Explain how range search is performed in a B^+ tree. Give examples. (7M)

7. a) Insert the below elements into an initially empty Patrica: (7M)
   1000, 0010, 1001, 1100, 0000, 0001
   b) Explain about compressed tries with skip fields. (7M)
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