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Reg. No.:	
Question Paper Code: 7039	7
M.E./M.Tech. DEGREE EXAMINATIONS, NOVEMBER/DIFFERST Semester Biometrics and Cyber Security CP 5151 – ADVANCED DATA STRUCTURES AND AL (Common to M.E. Computer Science and Engineering/M.E. Computering (With Specialization in Networks)/M.E. Multime M.E. Software Engineering/M.Tech. Information Technology	GORITHMS mputer Science and nedia Technology/
Time: Three Hours	Maximum: 100 Marks
Answer ALL questions	
PART – A	(10×2=20 Marks)
1. How do you analyze an algorithm?	
2. Write an algorithm to find the nth prime number and find its to	ime complexity.
3. Mention the properties of Red-Black tree.	
4. What is the procedure to delete a key from B-tree?	
5. Give a structure for strongly connected graph.	
6. How do you calculate minimum cost in a directed acyclic graph	1?
7. State the elements of dynamic programming.	
8. What are the complexities in Huffman codes?	
9. What is the need of a polynomial time algorithm?	
10. Define reducability.	e _k
PART-B	(5×13=65 Marks)
 11. a) i) Illustrate the basic principles of insertion sort. ii) Show that (n + 1)⁵ is O(n⁵), 2ⁿ⁺¹ is O(2ⁿ), n³logn is Ω(n³) (OR) 	(7) (6)
 b) i) Solve the following recurrence relation by using the meth function, h_n = h_{n-1} + h_{n-2}, n ≥ 2, h₀ = 1, h₁ = 3. ii) Write a detailed note on asymptotic notations. 	hod of generating (7) (6)

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12. a) i) Explain how do you insert a node in B-trees, with example. (7) (1) Write a short notes on Fibonacci heaps. (OR) b) i) Discuss in detail about the mergeable heap operations. (ii) Compare binary search tree with B-tree. 13. a) i) Explain how Dijkstra's algorithm can be modified to produce a count of the number of different minimum paths from one vertex to another vertex. (OR) b) i) Describe the basic concepts of the Bellman-Ford algorithm, with an example. (OR) b) i) Describe the basic concepts of the Floyd-Warshall algorithm. (14. a) i) Discuss the steps involved in developing dynamic programming algorithm. ii) Illustrate the basic principles of obtaining longest common subsequence with an example. (OR) b) i) Explain in detail about the activity selection problem, with example. ii) Write a detailed note on the elements of greedy strategies. (5) 15. a) Prove that clique decision problem is NP hard. (OR) b) Prove that vertex cover is NP complete. (OR) PART — C (1×15=15 Marks) (OR) b) Explain the concept of querying. How this is used in case of binary search tree? How this is proceeded for implementation? Illustrate its flow for a specific query. (OR) b) Explain the concept of minimum spanning tree. How do you obtain the principles of the given tree? Illustrate a suitable algorithm and		THEN THE BOARD WITH SAME HAD THE
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