IEC College of Engineering and Technology, Greater Noida
Department of CSE/IT
Odd Sem., Session 2022-23
Assignment-5

Subject Name with Code: Design and Analysis of Algorithms (KCS-503) Submission Date: D/M/22

1. **Explain Randomized algorithm in brief.**
2. **Explain NP-complete and NP-Hard.**
3. **Write Rabin Karp string matching algorithm. Working modulo q=11, how many spurious hits does the Rabin karp matcher in the text T=3141592653589793, when looking for the pattern P=26.**
4. **Write and explain the algorithm to solve vertex cover problem using approximation algorithm.**
5. **Explain and Write the Knuth-Morris-Pratt algorithm for pattern matching also write its time complexity.**
6. **Explain Fast Fourier Transform in brief.**
7. **Write an algorithm for naive string matcher?**
8. **Write KMP algorithm for string matching? Perform the KMP algorithm to search the occurrences of the pattern abaab in the text string abbabaabaabab.**
9. **Write short notes on following:**
   - **(i.) Randomized algorithm.**
   - **(ii.) NP- complete and NP hard.**
10. **What is approximation algorithm? Explain set cover problem using approximation algorithm.**
11. **The recurrence T (n) =7T (n/2) +n2 describe the running time of an algorithm A.A competing algorithm A has a running time of T' (n) =aT' (n/4) +n 2 .What is the largest integer value for a A' is asymptotically faster than A?**
12. **Discuss the problem classes P, NP and NP –complete .with class relationship.**
13. **Compute the prefix function π for the pattern P= a b a c a b using KNUTH-MORRIS –PRATT Algorithm. Also explain Naïve String Matching algorithm.**
14. **Explain Approximation and Randomized algorithms.**
15. **Explain applications of FFT.**
16. **What do you mean by polynomial time reduction?**
17. **Define NP-Hard and NP- complete problems. What are the steps involved in proving a problem NP-complete? Specify the problems already proved to be NP-complete.**
18. **Describe in detail Knuth-Morris-Pratt string matching algorithm. Compute the**
19. **prefix function π for the pattern ababbabbabbababbabb when the alphabet is Σ = {a,b}.**
20. **What is an approximation algorithm? What is meant by P (n) approximation algorithms? Discuss approximation algorithm for Travelling Salesman Problem.**