PG – 390

IV Semester M.C.A. Examination, June 2017
(CBCS)
COMPUTER SCIENCE
MCA402T : Advanced Algorithms

Time : 3 Hours Max. Marks : 70

PART – A

Answer **any five** of the following. **Each** question carries **six** marks. **(5×6=30)**

1. Use a recursion tree to solve the recurrence

   $T(n) = 2T\left(n/2\right) + n.$

2. Solve the following recurrence using substituion method

   $T(n) = 4T\left(n/2\right) + n.$

3. Produce Euclid's algorithm to find the GCD of two integers and comment on the efficiency of the algorithm.

4. Prove that the system $(Z_n, +_n)$ is a abelian group.

5. Produce Naive pattern matching algorithm and investigate the efficiency of the algorithm.

6. Explain set covering problem.

7. Solve the following instance of subset sum problem

   $S = \{10, 14, 15, 19\}$ $T = 35$ $\varepsilon = 0.3.$

8. Explain Dynamic programming strategy. Apply it to generate Fibonacci series.

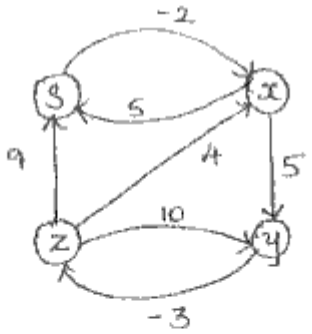
P.T.O.

PART – B

Answer **any four** of the following questions. **Each** question carries **10** marks. **(10×4=40)**

9. Illustrate the potential method using stack operations.

10. Using Beliman ford algorithm find the shortest path from the source vertex S to the remaining vertices in graph



11. Write Chinese remainder theorem. Also find all the integers that leave remainder 1, 2, 3 when divided by 9, 8, 7 respectively using Chinese remainder theorem.

12. Explain Johnson's algorithm for sparse graphs.

13. Explain Rabin-carp algorithm for pattern matching.

    Trace the algorithm to search "aab" in "abaaab".

14. Write short notes on :

    a) Flow networks. 5

    b) DFT and FFT. 5