M.Sc. (Part–II) Semester—IV (CBCS Pattern) Examination

COMPUTER SCIENCE

Paper—4 MCS 2 (Design and Analysis of Algorithms)

Time : Three Hours] [Maximum Marks : 80

N.B. :— (1) Illustrate your answers with the help of suitable examples/diagrams wherever necessary.

(2) Assume suitable data wherever necessary.

1. (A) State and explain Divide and Conquer Technique. 7

   (B) Write an algorithm for merge soft. 7

OR

2. (A) Write an algorithm for selection sort. 7

   (B) What is complexity of an algorithm ? Explain with example. 7

3. (A) What are optimal binary search trees ? Explain with example. 7

   (B) What is 0/1 Knapsack problem ? Explain. 7

OR

4. (A) What are minimum spanning trees ? Explain. 7

   (B) What are optimal merge patterns ? Explain. 7

5. (A) What is code-optimization ? Explain with example. 7

   (B) What are AND/OR graph ? Explain. 6

OR

6. (A) What is Back tracking ? Explain. 6

   (B) State and explain 8-Queens problem. 7

7. (A) State and explain fast Fourier transform algorithm. 7

   (B) State and explain Horner's Rule. 6

OR

8. (A) State and explain the applications of Fourier transformation. 7

   (B) What is I.C Search ? Explain. 6

9. (A) How comparison trees are used for sorting ? Explain. 7

   (B) What are ordered searching ? Explain. 6

OR

10. (A) How to derive lower bounds on algebraic problems ? Explain. 7

    (B) What are comparison trees ? Explain. 6

11. (A) State and explain Nondeterministic Algorithm. 5

    (B) Explain :—

    (i) CDP

    (ii) CNDP. 8

OR

12. (A) What is NP-Hard problem for Code generation ? Explain. 7

    (B) State and explain Cook's theorem. 6