**SSESA's Science College, Congress Nagar, Nagpur.**

**M.Sc. - Semester-I**

**Assignment List**

**2019-20**

**Paper I: Discrete Mathematical Structure**

Q.1 Explain the principle of mathematical induction.
Q.2 Prove De'Morgan's theorem for set.
Q.3 Explain the different Connectives used for mathematical logic.
Q.4 State and explain pigeonhole principle.
Q.5 Explain properties of Relations. What is equivalence relation?
Q.6 Explain transitive closure and Warshall's algorithm with suitable example.
Q.7 What is permutation functions? Explain.
    i) Cyclic permutation
Q.8 Explain the terms:
    i) Euler paths and Circuits
    ii) Hamiltonian paths and Circuits
Q.9 Explain with example:
    i) Partially ordered set
    ii) Hasse diagrams
Q.10 What is lattice? Explain with example.
Q.11 What is minimal spanning trees? Explain.
    i) Kruskal's algorithm
    ii) Prim's algorithm
Q.12 Explain Isomorphism and Homomorphism.
Q.13 What is Phase structure grammar? Explain with example
Q.14 Explain:i)Semigroup ii) Monoid
Q.15 What is Finite state machine? Explain with example.

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**Assignment List**

**M.Sc.(Computer Science)Semester-III**

**Software Engineering**

**2019-2020**

1. Explain Software Myths and also explain role of software engineering in detail.
2. Describe the Capability Maturity Model Integration (CMMI).
3. Describe the different characteristics of software & Also explain changing nature of software in brief.
4. Write a short note on: a) Waterfall model b)Spiral model.
5. What is mean by Process? Explain process framework activities.
6. Explain Requirement Engineering & functions used in RE.
7. What is system Modeling ? How graphical model can be used to present software system.
8. Explain a) Context model b) Behavioural model.
9. Explain Validation testing with its importance.
10. Describe Software testing and also explain fundamental testing goals.
11. What is system design? Explain characteristics of good design.
12. Explain design evolution & interface analysis.
13. Write a short note on: a)White box testing b)Black box testing.
14. What is Software quality & its quality factors.
15. What is Software Quality Management? Explain 9000 Quality standards.
16. Explain the features of Risk Identification and Risk Projection.
17. Explain Software risk? What is RMMI plan.
18. What is risk management? Explain the strategies of risk management.
19. Explain a)Software Quality Assurance(SQA) b) Formal technical Review.
20. Write a note on Architectural Design

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SSESA's Science College, Congress Nagar, Nagpur.

**M.Sc. - Semester-II**

# Assignment List

**2019-20**

## Paper II: Theory of Computation & Compiler Construction

Q.1 Explain Deterministic and Non Deterministic finite automata with example.

Q.2 State and Prove the pumping lemma for Regular Expression.

Q.3 What do you mean by Context Free Grammar? Explain.

Q.4 Explain Useless Symbol with the help of example.

Q.5 Explain Chomsky Normal form and Greibach normal form with example.

Q.6 Design a PDA for the language L= $\{WcW^R/W$ is in $(0+1)^*\}$.

Q.7 Design Turing machine for the language L= $\{WW^R/W$ is in $(0+1)^*\}$.

Q.8 Design compiler .Discuss the structure of compiler.

Q.9 What is operator precedence parser? explain in detail.

Q.10 What are register and address descriptor.

Q.11 Explain Three address code, Quadruples and Triples.

Q.12 Explain Shift reduce parsing with example.

Q.13 Explain the construction of SLR parsing table.

Q.14 Explain the contents and data structures used for symbol tables.

Q.15 Explain the process of code generation from DAG's.

Co-ordinator(M.Sc.)
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Congress Nagar, Nagpur

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## SSESA's, Science College, Congress Nagar, Nagpur

## Assignment 2019-20

## M. Sc. Semester - IV

## Paper: - II – Artificial Intelligence and Expert System

1. Explain different techniques of Artificial Intelligence.
   i) Question Answering ii)Tic Tac Toe
2. Explain:
   i) Breadth First Search ii) Depth First Search
3. Describe Water Jug Problem in detail.
4. Explain:
   i) Knowledge representation ii) Mapping.
5. Explain Predicate logic with suitable example.
6. Explain Expert system in detail.
7. Describe Semantic and Syntactic Analysis.
8. What is Planning? Explain components of planning system.
9. Write short note on Alpha–beta cutoffs
10. Explain distributed and parallel AI.
11. Explain minimax search procedure in game playing.
12. Write note on Natural Language Processing.

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DEPARTMENT OF COMPUTER SCIENCE
Congress Nagar, Nagpur
M.Sc. Semester - IV
Paper - IV

# Parallel Computing

## Assignment List

1. What is implicit parallelism and explain trends in microprocessor architectures?
2. Describe the communication costs in parallel machines.
3. How works routing mechanisms for interconnection networks.
4. Explain the network topologies in parallel computing.
5. Write notes on principles of parallel algorithm design and explain its preliminaries.
6. How to perform decomposition techniques.
7. What are the methods for containing interaction overheads?
8. Explain All-to-All personalized communication.
9. What is the performance metrics for parallel systems?
10. Explain the building blocks send and receive operations.
11. Write the principles of message passing programming.
12. What are the collective communication and computation operations?
13. Explain matrix-vector multiplication.
14. Explain the serial algorithm in FFT.
15. Describe parallel depth-first search.
16. Describe the transpose algorithm in details.

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