M.Sc. - Semester-I
Assignment List
2020-21
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
Session 2020-21
M. Sc.-Final (Semester-III) Practical – I
Paper-II (Software Engineering)

1. What is software? Give different characteristics of software and explain changing nature of software in detail.

2. Explain role of software engineering and software myths in detail.

3. Explain a) waterfall model b) spiral model.

4. What is process? Explain process framework activities.

5. What is requirement engineering? Explain functions used in requirement engineering.

6. What is system modeling? How graphical model can be used to present software system.

7. Write note on a) context model b) behavioral model

8. What is design? Explain characteristics of good design.

9. What is software testing? Explain fundamental testing goals.

10. Explain a) white box testing b) black box testing.

11. What is software quality? Explain its quality factors.

12. Write note on design evolution and interface analysis.

13. Explain a) software quality assurance b) formal technical review

14. What is risk management? Explain strategies of risk management

15. What is software Quality management? Explain 9000quality standards.

16. What is software risk? Explain RMMI plan.

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M.Sc. (Computer Science) Semester III
Assignment List (Session 2020-21)
Paper IV: Mobile Computing

1. What is mobile communication? Explain mobile computing architecture.
2. What are handheld devices? Explain the limitations of mobile devices.
3. Explain the automotive system architecture.
4. Explain the types of medium access control.
5. Write down the coding methods in CDMA.
6. Explain mobile IP network layer.
7. Explain Database Hoarding and caching techniques.
8. Explain in detail unicast mode broadcasting architecture for communication asymmetry.
9. Explain MANET (Mobile Ad-hoc Network).
10. Explain wireless application environment.

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M.Sc - I Semester-II
Assignment List 2020-21
Theory of Computation & Compiler Construction

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

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

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

4. Explain Useless Symbol with the help of example.

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

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

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

8. Define compiler. Discuss the structure of compiler.

9. What is parameter transmission. Explain its three common method.

10. What are register and address descriptor.

11. Explain Three address code, Quadruples and Triples.

12. Explain Shift reduce parsing with example.

13. Explain the construction of SLR parsing table.

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

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

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1. Explain in detail the different layers used in Computer architecture.

2. A 1-bit full subtractor implements the arithmetic equation.

$$b_i z_i = x_i - y_i - b_{i-1}$$

where z_i and b_i denote the difference and borrow functions respectively (a) Derive a pair of logical equations defining z_i and b_i (b) Design an n bit subtractor whose operation is analogous to that of a ripple carry adder.

3. Design a contol part of four channel DMA controller. Draw and discuss

   (i)   State transition graph

   (ii)   Condensed state table.

4. Draw the overall structure of carry-lookahead adder.

5. Design a memory unit of 16 KB RAM using sufficient number of available 4 KB RAM. Draw a designed diagram using decoder circuit. Give its address table.

6. Design a memory map for 4 KB RAM and 8 KB ROM. The available chips are:

- 2 KB RAM x 2 Number
- 2 KB- ROM x4 Numers respectively

Design a decoder using address table method.

7. A microprocessor employs RAM chip of 1K x 4 and ROM chip of 4 KB. The lower locations are available in RAM chip. The available chips are

- RAM 1K x 2 (2 No)
- ROM 2 KB (2 No)

Find out the chip select signal using decoder.

8. Design a memory unit of 8 KB RAM with available 2 KB RAM. Also design a decoder using address table method.

9. Design a memory unit for 4 K x 8 RAM. The available chips are 2K x 4 (4 Nos.) RAM. Also design a decoder using address table method.

10. The access time of cache memory is 100 ns and that of main memory 1000 ns. It is estimated that 80% of the memory request are for read and the remaining 20% for write. The Hit ratio for access only is 0.9. A write through procedure is used.

   (i) What is the average access time for memory read only?

   (ii) What is the average access time for memory read and write request?

11. Design a memory unit for 4 KB RAM and 6 KB ROM. The available chips are as follows:

    (i) 2 KB RAM (2 Nos.)

    (ii) 3 KB ROM (2 Nos.)

    Also design a decoder using address table method. Lower locations are available in the RAM unit.

12. What is virtual memory? Explain the concept of paging and segmentation.

13. Describe the daisy-chain priority interrupt system in detail.

14. What is PCI bus? Discuss the role of PCI bus in computer system organization.

15. Discuss the Transaction processing benchmark in detail.

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Paper-I (Data Mining)

Assignment List

Session 2020-21

1) What is data mining? Explain Motivating challenges for data mining.

2) Explain different data mining task.

3) What is data? Explain different types of dataset.

4) What is data quality and also explain issues related to data collection and application.

5) Explain data processing in brief.

6) Write a note on measures of data similarity and dissimilarity.

7) Write a note on different techniques used for data exploration using statistic.

8) What is data visualization? Explain different techniques used for data visualization.

9) What is OLAP? Explain OLAP in detail for multidimensional data analysis.

10) What is classification? Explain different classification techniques.

11) What is decision tree? Explain how decision tree can build.

12) Explain methods for comparing classifiers.

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Department of Computer Science
M.Sc.(Computer Science) Sem IV
Paper-II (Artificial Intelligence)
Assignment List
Session 2020-21

Que: 1 Explain different techniques of Artificial Intelligence.

    i) Question Answering   ii)Tic Tac Toe

Que: 2 Explain:

    i) Breadth First Search   ii) Depth First Search

Que: 3 Describe Water Jug Problem in detail.

Que: 4 Explain:

i) Knowledge representation   ii) Mapping.

Que: 5 Explain Predicate logic with suitable example.

Que: 6 Explain Expert system in detail.

Que: 7 Describe Semantic and Syntactic Analysis.

Que: 8 What is Planning? Explain components of planning system.

Que: 9 Write short note on Alpha–beta cutoffs.

Que: 10 Explain distributed and parallel AI.

Que: 11 Explain minimax search procedure in game playing.

Que: 12 Write note on Natural Language Processing

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Parallel Computing
Assignment List (2020-21)

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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