SCHOOL OF DISTANCE EDUCATION

UNIVERSITY OF KERALA

M.Sc. Computer Science (2022 Admission)

Ist Semester Assignment

DCS 11 -COMPUTER ARCHITECTURE

1) Describe about PRAM model of parallel computation.
2) Explain the following
   a. Job sequencing
   b. Pipeline chaining
   c. Collision & Collision prevention in pipelining
3) Explain about superscalar and super pipeline design.
4) Explain in detail various data transfer in I/O Interface.
5) Describe Instruction Level Parallelism (ILP).

DCS12 –DATA STRUCTURES AND ALGORITHMS

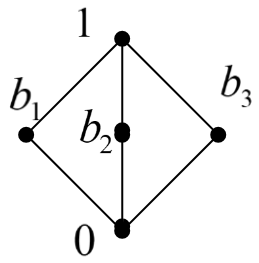
1) Explain various methods for analyzing the performance of an algorithm.
2) Explain how Strassen's matrix multiplication outperforms standard matrix multiplication.
3) Write and explain for n queen problem using backtracking
4) Explain the general method of greedy technique with control abstraction.
5) Write notes on NP hard and NP Completeness. Write few examples for each.

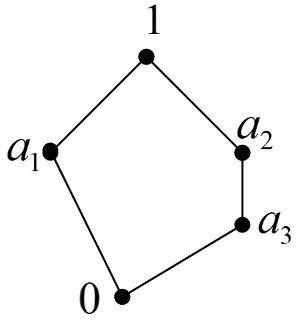
DCS 13–MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

1. Draw a Venn diagram that represents the following relationships.
   (a) $A \cap (B \cup C)$ (b) $\overline{\overline{A} \cap \overline{B} \cap \overline{C}}$ (c) $A \cup \overline{B}$
2. Write an explicit formula for the sequence 2,5,8,11,14,17……
3. Let R be the following symmetric relation on the set A = {1,2,3,4,5}:
   R = {(1,2),(2,1),(3,4),(4,3),(3,5),(5,3),(4,5),(5,4),(5,5)}. Draw the graph of R.
4. Prove or disprove that if a relation R on A is transitive, then R^2 is also transitive.
5. Show that $2^n < n!$ for $n \geq 4$.
6. Compute each of the following

a) Let f be the **mod 10** function, find $f(417)$, $f(38)$, $f(253)$, $f(316)$
b) $\lceil 2.78 \rceil$
c) $\lceil -2.78 \rceil$
d) $\lceil 14 \rceil$
e) $\lfloor -17.3 \rfloor$
f) $\lfloor 21.5 \rfloor$

7. Verify whether the lattice given in the following diagrams are distributive or not.





8. Show that $(P \to Q) \wedge (R \to Q) \Leftrightarrow (P \vee R) \to Q$

9. Construct the truth tables of the following formulas:

a. $(Q \wedge (P \to Q)) \to Q$

b. $\neg (P \vee (Q \wedge R)) \leftrightarrow (P \vee Q) \wedge (P \vee R)$

6. Find the Cayley table for the permutation group S_3.

7. Show that every cyclic group of order n is isomorphic to the group $< Z_n, +_n >$

8. Describe Koenigsberg bridge problem.

9. Let G be graph with exactly one spanning tree. Prove that G is a tree.

10. Show that the set of all integers is an abelian group with respect to addition,

DCS 14 -PROGRAMMING PARADIGMS

1. Explain in detail about AWT event hierarchy and explain the features of JAVA Swing.
2. Explain the Various States of thread with diagram?
3. Write Short notes on
    a) Late binding
    b) Applets
    c) Get ( ) and Post( ) method
    d) CSS
    e) DOM
4. Write note on interactive development tools and debugging tools.
5. Explain the basic Servlet Architecture and its Session Management in detail?

DCS 15- COMPUTER NETWORKS

1. Discuss Interconnecting devices.
2. Explain DHCP in detail.
3. Define multiplexing ,explain phase shift keying and amplitude shift keying.
4. **Write notes on the following**
    a. Wireless Sensor Networks
    b. VPN
    c. LiFi and IOT
    d. LEO Orbit
    e. Base station
5. Describe about GSM architecture with neat diagram.

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