UNIVERSITY OF KERALA

SCHOOL OF DISTANCE EDUCATION

M.Sc. Computer Science (2021 Admission)

I Semester Assignment

DCS 11 -COMPUTER ARCHITECTURE

1) Explain about pipeline control methods.
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) Explain in detail about virtual memory.

DCS12 –DATA STRUCTURES AND ALGORITHMS

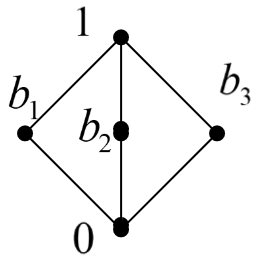
1) Explain various methods for analyzing the performance of an algorithm.
2) Explain how Strassen's matrix multiplication outperforms standard matrix multiplication.
3) Explain general methods of branch and bound.
4) Explain the general method of greedy technique with control abstraction.
5) Write notes on NP hard and NP Completeness. Write few examples for each.
6) What are randomized algorithms. Write and explain randomized Quicksort.

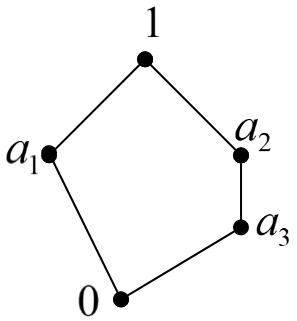
DCS 13–MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

1. Draw a Venn diagram that represents the following relationships.
   (a) $A \cap (B \cup C)$ (b) $\bar{A} \cap \bar{B} \cap \bar{C}$ (c) $A \cup \bar{B}$
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.

DCS 14 -PROGRAMMING PARADIGMS

1. Write a C++ program to illustrate Operator Overloading and Explain?
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. Explain AWT and its working with Graphics, Texts, Menus and Layouts with example.
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

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