SCHOOL OF DISTANCE EDUCATION

UNIVERSITY OF KERALA

M.Sc. Computer Science (2024 Admission)

Ist Semester Assignment

DCS 11 -COMPUTER ARCHITECTURE

1) Describe about PRAM model of parallel computation.
2) Explain the following
   a) Job sequencing
   b) Addressing modes
   c) Collision & Collision prevention in pipelining
   d) Superscalar and super pipeline design.
3) Explain the components of Asynchronous communication interface.
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 a short note on
   a) Depth First Search Algorithm
   b) n queen problem using backtracking
   c) Single Source Shortest Path
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. (b)$A \cap B \cap C$
   c. $A \cup B$
2. Let R be the following symmetric relation on the set A = {1,2,3,4,5}:
3. 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. Write note on
    a) Semigroup
    b) Monoids
    c) Subgroup
    d) DFA and NFA
    e) Koenigsberg bridge problem
7. Show that $(P \to Q) \wedge (R \to Q) \Leftrightarrow (P \vee R) \to Q$
8. Construct the truth tables of the following formulas:
    a) $(Q \wedge (P \to Q)) \to Q$
    b) $\neg (P \vee (Q \wedge R)) \leftrightarrow (P \vee Q) \wedge (P \vee R)$
9. Two dice are rolled, find the probability that the sum is
    a) Equal to 1
    b) Equal to 4
    c) Less than 3
10. Let G be graph with exactly one spanning tree. Prove that G is a tree.

DCS 14 -PROGRAMMING PARADIGMS

1. Explain static and dynamic memory allocation.
2. Write notes on interactive development tools and debugging tools.
3. Explain the various States of thread with diagram?
4. Write Short notes on
    a) Interfaces
    b) Applets
    c) Get ( ) and Post( ) method
    d) DOM
    e) CGI
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. HiperLAN
d. LEO Orbit
e. Frequency Shift Keying

5. Describe about GSM architecture with neat diagram.

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