

Program: BE Computer Engineering

Curriculum Scheme: Revised 2016

Examination: Third Year Semester

Course Code: **CSDLO5013** and Course Name: **Advance Algorithm**

Time: 1 hour

Max. Marks: 50

=====

Note to the students: - All the Questions are compulsory and carry equal marks.

Q1.	Which of the following method is taking overcharge for some operations in amortized analysis
Option A:	aggregate method
Option B:	potential method
Option C:	average method
Option D:	accounting method
Q2.	For solving recurrences, which of the following method is used to generate a good guess of the solution?
Option A:	Iteration method
Option B:	Substitution method
Option C:	Recursion tree method
Option D:	Master method
Q3.	Calculate complexity of the given recurrence equation. $T(n) = 4T(n/2) + n^2$
Option A:	$\Theta(n)$
Option B:	$\Theta(n \log n)$
Option C:	$\Theta(n^2)$
Option D:	$\Theta(n^2 \log n)$
Q4.	How many cases are there in under master method?
Option A:	2
Option B:	3
Option C:	4
Option D:	5
Q5.	If $T(n) = T(n/2) + n$, then the complexity will be as follows:
Option A:	$O(\log n)$
Option B:	$O(n)$
Option C:	$O(n \cdot \log n)$
Option D:	$O(n^2)$
Q6.	Which method of amortized analysis keeps the same amortized cost for all the

	operations?
Option A:	Aggregate Analysis
Option B:	Accounting Method
Option C:	Potential Method
Option D:	Dynamic Table
Q7.	When to prefer Red-black trees over AVL trees?
Option A:	When $\log(\text{nodes})$ time complexity is needed.
Option B:	When more search operations are needed.
Option C:	When there are more insertions or deletions.
Option D:	When tree must be balanced
Q8.	The number of black nodes from the root to a node is the node's _____; the uniform number of black nodes in all paths from root to the leaves is called the _____ of the red-black tree.
Option A:	Black depth, Black height
Option B:	Black height, black depth
Option C:	red depth, red height
Option D:	red height, red depth
Q9.	What is the special property of red-black trees and what root should always be?
Option A:	a color which is either red or black and root should always be black color only
Option B:	height of the tree
Option C:	pointer to next node
Option D:	a color which is either green or black
Q10.	When inserting a new entry into red black tree, the newly created node will be
Option A:	red, if the new node is not the root node
Option B:	red, if the new node is the root node
Option C:	black if the new node is not the root node
Option D:	the same color as its sibling
Q11.	How many nodes a binomial tree B_k consists of?
Option A:	k
Option B:	2^{k-1}
Option C:	2^{k+1}
Option D:	2^k
Q12.	The number of trees in a binomial heap with n nodes is
Option A:	$\log n$
Option B:	n
Option C:	$n \log n$
Option D:	$n/2$
Q13.	Which technique of Ford- Fulkerson algorithm helps it to solve max flow problem
Option A:	Naive greedy algorithm approach

Option B:	Minimum spanning tree
Option C:	Residual graphs
Option D:	Minimum cut
Q14.	The flow from vertex u to vertex v is the negative of the flow in reverse direction is called as
Option A:	Capacity constraint
Option B:	Skew Symmetry
Option C:	Flow conservation property
Option D:	Residual Capacity
Q15.	The complexity of the ford fulkerson algorithm is
Option A:	$O(V^2E)$
Option B:	$O(E \log V)$
Option C:	$O(E f^*)$
Option D:	$O(V^3)$
Q16.	In what time can an augmented path be found?
Option A:	$O(E \log V)$
Option B:	$O(E)$
Option C:	$O(E ^2)$
Option D:	$O(E ^2 \log V)$
Q17.	Which is the correct technique for finding a maximum matching in a graph?
Option A:	DFS traversal
Option B:	BFS traversal
Option C:	Shortest path traversal
Option D:	Heap order traversal
Q18.	Closest pair algorithm using brute force performs which basic operation
Option A:	Euclidean distance
Option B:	Manhattan distance
Option C:	Area
Option D:	Radius
Q19.	If the cross product of the vectors p1 and p2 is 0 then
Option A:	p1 is clockwise from p2 with respect to the origin (0,0).
Option B:	p1 is counterclockwise from p2 with respect to the origin (0,0).
Option C:	Either p1 is clockwise from p2 or p2 is clockwise from p1
Option D:	p1 and p2 are collinear, pointing in either opposite or same direction.
Q20.	For vectors p1 and p2 to check if p1 is clockwise from p2 with respect to origin(0,0) which of the following is true:
Option A:	$p1 \times p2$ is +ve
Option B:	$p1 \times p2$ is -ve
Option C:	$p1 \times p2$ is 0

Option D:	p1 and p2 are collinear, pointing in either opposite or same direction.
Q21.	The running time of graham scan Algorithm for solving convex hull is(n =number of points in set Q).
Option A:	$O(n)$
Option B:	$O(n \cdot \log n)$
Option C:	$O(\log n)$
Option D:	$O(n^2)$
Q22.	Let X is a problem that belongs to the class NP. Then which one of the following is TRUE?
Option A:	There is no polynomial time algorithm for X.
Option B:	If X can be solved deterministically in polynomial time, then $P = NP$.
Option C:	If X is NP-hard, then it is NP-complete.
Option D:	X may be undecidable.
Q23.	To prove NP-Completeness of a problem
Option A:	Select a known P problem
Option B:	Select a known NP problem
Option C:	Select a known NP-Complete problem
Option D:	Select a known NP-Hard problem
Q24.	Problems that cannot be solved by any algorithm are called?
Option A:	tractable problems
Option B:	intractable problems
Option C:	undecidable problems
Option D:	decidable problems
Q25.	In a binary max heap containing n numbers, the smallest element can be found in time
Option A:	$O(n)$
Option B:	$O(\log n)$
Option C:	$O(\log \log n)$
Option D:	$O(1)$