University of Mumbai

Examination 2020 under cluster 4 (PCE)

Program: BE Computer Engineering
Curriculum Scheme: Rev2012
Examination: Final Year Semester VII
Course Code: CPE7021 and Course Name: Advanced Algorithm

Time: 1 hour Max. Marks: 50

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

Q1.	A binomial heap with n nodes has --------number of trees
Option A:	logn
Option B:	n
Option C:	nlogn
Option D:	n/2
Q2.	In all the paths of the RB tree, there should be same number ------- nodes.
Option A:	Black
Option B:	Red
Option C:	Red and Black
Option D:	Black and Red
Q3.	There should not be two consecutive ------------nodes in RB tree
Option A:	Black
Option B:	Red
Option C:	Brown
Option D:	Green
Q4.	What is the time complexity of 100 x 200, 200 x 300 and 300 x 400 matrix chain multiplication problem?
Option A:	O(1)
Option B:	O(n)

Option C:	O(n^2)
Option D:	O(n^3)
Q5.	Bellman Ford Algorithm is an example for...........
Option A:	Dynamic Programming
Option B:	Greedy Algorithms
Option C:	Linear Programming
Option D:	Branch and Bound
Q6.	What does Maximum flow problem involve
Option A:	finding a flow between source and sink that is maximum
Option B:	finding a flow between source and sink that is minimum
Option C:	finding the shortest path between source and sink
Option D:	computing a minimum spanning tree
Q7.	If the number of available constraints is 3 and the number of parameters to be optimized is 4, then
Option A:	The objective function can be optimized
Option B:	The constraints are short in number
Option C:	The solution is problem oriented
Option D:	The constraints are sufficient in number
Q8.	Area of parallelogram can be find out by....
Option A:	cross product of two vectors
Option B:	dot product of two vectors
Option C:	multiplication of vectors
Option D:	dot product of one vector & one number

Q9.	Which is more efficient algorithm in flow network
Option A:	Ford Fulkerson
Option B:	Push to Relabel
Option C:	Relabel to front
Option D:	Bipartite
Q10.	Find the complexity of T (n) = 3T (n/2) + n^2
Option A:	ϴ (n^4)
Option B:	ϴ (n^2)
Option C:	ϴ (2^n)
Option D:	ϴ (n)
Q11.	The graph of x≤2 and y≥2 will be situated in the
Option A:	First and second quadrant
Option B:	Second and third quadrant
Option C:	First and third quadrant
Option D:	Third and fourth quadrant
Q12.	In. L.P.P----
Option A:	objective function is linear
Option B:	constraints are linear
Option C:	Both objective function and constraints are linear
Option D:	Neither objective function nor constraints are linear
Q13.	To which type of problems does quick hull belong to?
Option A:	numerical problems
Option B:	computational geometry
Option C:	graph problems
Option D:	string problems
Q14.	What is order of tree after merging two tree of order k?
Option A:	2*k
Option B:	k+1
Option C:	k*k

Option D:	k+logk
Q15.	For the binomial tree Bk the height of tree is -----
Option A:	2K
Option B:	k+1
Option C:	K
Option D:	K-1
Q16.	This algorithm maintains list of vertices to compute maximum flow
Option A:	Ford Fulkerson
Option B:	Bipartite algorithm
Option C:	Relabel to front
Option D:	Prims algorithm
Q17.	The area of the feasible region for the following constraints $3y + x \geq 3$, $x \geq 0$, $y \geq 0$ will be
Option A:	Bounded
Option B:	Unbounded
Option C:	Convex
Option D:	Concave
Q18.	The Master Theorem applies to recurrences of the following form
Option A:	T (n) = aT (n/b) + f(n)
Option B:	T (n) = T (n/b) + f(n)
Option C:	T (n) = T (n) + f(n)
Option D:	T (n) = aT (n) + f(n)
Q19.	What is the average case complexity of a convex hull algorithm?
Option A:	O(n)
Option B:	O(nlogn)
Option C:	O(n^2)
Option D:	O(log n)

Q20.	Which of the following is the recurrence relation for the matrix chain multiplication problem where mat[i-1] * mat[i] gives the dimension of the ith matrix?
Option A:	dp[i, j] = 1, if i=j, dp[i, j] = min{dp[i, k] + dp[k+1, j]}
Option B:	dp[i, j] = 0, if i=j, dp[i, j] = min{dp[i, k] + dp[k+1, j]}
Option C:	dp[i, j] = 1, if i=j, dp[i, j] = min{dp[i, k] + dp[k+1, j]} + mat[i-1]*mat[k]*mat[j]
Option D:	dp[i, j] = 0, if i=j, dp[i, j] = min{dp[i, k] + dp[k+1, j]} + mat[i-1]*mat[k]*mat[j]
Q21.	How many colors are used in a bipartite graph?
Option A:	1
Option B:	2
Option C:	3
Option D:	4
Q22.	The region represented by $2x+3y-5\leq 0$ and $4x-3y+2\leq 0$, is
Option A:	Not in first quadrant
Option B:	Unbounded in first quadrant
Option C:	Bounded in first quadrant
Option D:	Bounded in second quadrant
Q23.	The objective function for a L.P model is $3x1 + 2x2$, if $x1 = 20$ and $x2 = 30$, what is the value of the objective function?
Option A:	0
Option B:	50
Option C:	60
Option D:	120
Q24.	The most important condition for which closest pair is calculated for the points (p_i, p_j) is
Option A:	i>j
Option B:	i!=j
Option C:	i=j
Option D:	i<j
Q25.	What is the basic operation of closest pair algorithm using brute force technique?
Option A:	Euclidean distance
Option B:	Radius
Option C:	Area
Option D:	Manhattan distance

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Question	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	A
Q2.	A
Q3.	B
Q4	D
Q5	A
Q6	A
Q7	B
Q8.	A
Q9.	C
Q10.	B
Q11.	B
Q12.	C
Q13.	B
Q14.	B
Q15.	C
Q16.	C
Q17.	B
Q18.	A
Q19.	B
Q20.	D
Q21.	B
Q22.	B
Q23.	D
Q24.	D
Q25.	A