Program: _____
Curriculum Scheme: Rev2016
Examination: TE Semester V
Course Code: CSDLO5013 and Course Name: Advance Algorithms
Time: 2 hour Max. Marks: 80
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Q1.	def f() ans = 0 for i = 1 to n: for j = 1 to log(i): ans += 1 print(ans) What is the time Complexity of this program:
Option A:	O(n)
Option B:	**O(nlogn)**
Option C:	O(n2)
Option D:	O(n3)
Q2.	How is time complexity measured?
Option A:	By counting the number of statements in an algorithm
Option B:	By counting the number of primitive operations performed by the algorithm on a given input size
Option C:	By counting the size of data input to the algorithm
Option D:	By counting the size of file.
Q3.	To verify whether a function grows faster or slower than the other function, we cannot use _____notations.
Option A:	Big Omega Ω (f)
Option B:	Big Theta θ (f)
Option C:	Big Oh O (f)
Option D:	**Small Oh o (f)**

Q4.	We toss two faircoins simultaneously and independently. If the outcomes of the twocoins are the same , we win ;otherwise, we lose. Let A be the event that the first coin comes upheads, B be the event that the second coin comes upheads, and C be the event that we win. Which of the following statements is false?
Option A:	**Events A and C are independent.**
Option B:	Events A and B are not independent
Option C:	Events A and B are not conditionallyindependent given C
Option D:	The probability of winning is 1/2.
Q5.	The random variables X and Y have variances 0.2 and 0.5 respectively. Let Z= 5X-2Y. The variance of Z is?
Option A:	3
Option B:	4
Option C:	5
Option D:	7
Q6.	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:	red height, red depth
Option B:	red depth, red height
Option C:	**C) black depth, black height**
Option D:	D) black height, black depth
Q7.	In a Red-Black Tree, if a node is red, its child must be _____.
Option A:	Sometimes Red
Option B:	**Always Black**
Option C:	Always Red
Option D:	Sometimes Black
Q8.	which one is not right about the red_black tree?
Option A:	red_black tree is a binary search tree.

Option B:	In the average case, the time complexity of searching one member of the red_black tree is O(logn).
Option C:	In the average case, the time complexity of inserting one member into the red_black tree is O(logn).
Option D:	**An AVL tree is better than a red_black tree with same data memebers in searching, insert and so on.**
Q9.	The number of trees in a binomial heap with n nodes is
Option A:	**logn**
Option B:	n
Option C:	N/2
Option D:	N**logn**
Q10.	The main distinguishable characterstic of a binomial heap from a binary heap is that
Option A:	**it allows union operations very efficiently**
Option B:	it does not allow union operations that could easily be implemented in binary heap
Option C:	the heap structure is not similar to complete binary tree
Option D:	the location of child node is not fixed i.e child nodes could be at level (h-2) or (h-3), where h is height of heap and h>4
Q11.	In a binomial heap the root value is greater than left child and less than right child.
Option A:	Always
Option B:	**Never**
Option C:	depends on value
Option D:	Sometimes

Q12.	Which algorithm is used to solve a maximum flow problem?
Option A:	Prim's algorithm
Option B:	Kruskal's algorithm
Option C:	Dijkstra's algorithm
Option D:	**Ford-Fulkerson algorithm**
Q13.	A simple acyclic path between source and sink which pass through only positive weighted edges is called?
Option A:	**augmenting path**
Option B:	critical path
Option C:	residual path
Option D:	maximum path
Q14.	Which of the following is the correct type of spectrum of the bipartite graph?
Option A:	**Symmetric**
Option B:	Anti – Symmetric
Option C:	Circular
Option D:	Exponential
Q15.	Which approach is based on computing the distance between each pair of distinct points and finding a pair with the smallest distance?
Option A:	**Brute force**

Option B:	Exhaustive search
Option C:	Divide and conquer
Option D:	Branch and bound
Q16.	_____ is a method of constructing a smallest polygon out of n given points
Option A:	closest pair problem
Option B:	**quick hull problem**
Option C:	path compression
Option D:	union-by-rank
Q17.	Problems that can be solved in polynomial time are known as?
Option A:	intractable
Option B:	**tractable**
Option C:	decision
Option D:	complete
Q18.	Which of the following problems is not NP complete?
Option A:	Hamiltonian circuit
Option B:	Bin packing
Option C:	Partition problem

Option D:	**Halting problem**
Q19.	The choice of polynomial class has led to the development of an extensive theory called _____
Option A:	**computational complexity**
Option B:	time complexity
Option C:	problem complexity
Option D:	decision complexity
Q20.	o which class does the Vertex Cover problem belong?
Option A:	P class
Option B:	**NP** **class**
Option C:	Partition class
Option D:	Complete class

Q2 and Q3. **(20 Marks Each)**	***Please delete the instruction shown in front of every sub question***
A	**Solve any Two** **5 marks each**
i.	What is convex hull? Explain Jarvis' march in detail.
ii.	Explain delete operations in red black tree.
iii.	Write a note on amortized analysis.
B	**Solve any One** **10 marks each**
i.	Write a note on line segment properties.
ii.	Write a note on bipartite matching.