Printed page: 2 Subject Code: ACSBS0501

Roll No: | | | | | | | | | | | | |

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute)

Affiliated to Dr. A.P. J. Abdul Kalam Technical University, Uttar Pradesh, Lucknow

Course: B.Tech. **Branch: CSBS**

Semester 5th **Sessional Examination: 3rd**

Subject Name: Design and Analysis of Algorithm **Year- (2021- 2022)**

Time: 1.15 Hours **Max. Marks:30**

General Instructions:

- *This Question paper consists of .....pages & .....questions. It comprises three Sections -A, B, &C. You are expected to answer them as directed.*
- *Section A –Q.No- 1 is of one 1 mark each & Q. No- 2 carries 2 mark each.*
- *Section B- Q. No- 3 carries 5 marks each.*
- *Section C- Q.No-4 & 5 carries 6 marks each. Attempt any one part a or b*

		SECTION – A	[08Marks]	
1.	All questions are compulsory-		(4×1=4)	
	a.	A problem which is both _____ and _____ said to be NP complete. A) NP, P B) NP, NP hard C) P, P complete D) None of the mentioned	(1)	CO4
	b.	A randomized algorithm uses random bits as input inorder to achieve a _____ good performance over all possible choice of random bits. A) worst case B) best case C) average case D) none of the mentioned	(1)	CO4
	c.	The problem 3-SAT and 2-SAT are A) both in P B) both NP complete C) NP-complete and in P respectively	(1)	CO5

		D) undecidable and NP-complete respectively		
	d.	Unix sort command uses _____ as its sorting technique. A) Quick Sort B) Bucket Sort C) Radix Sort D) Merge Sort	(1)	CO5
2.		All questions are compulsory-	(2×2=4)	
	a.	Explain optimization problem.	(2)	CO4
	b.	Compare NP-hard and NP-completeness.	(2)	CO5
		SECTION – B	[10Marks]	
3.		Answer any two of the following-	(2×5=10)	
	a.	Discuss the string matching with finite automata.	(5)	CO4
	b.	Write about Cook's Theorem and also discuss its application.	(5)	CO4
	c.	Differentiate between tractable and non-tractable problems?	(5)	CO5
		SECTION – C	[12Marks]	
4		Answer any one of the following-	(1×6=6)	
	a.	Find out the smaller number of sets for following set cover problem. Universal set U = {1,2,3,4,5} and the set of sets S = {{1,2,3}, {2,4}, {3,4}, {4,5}}.	(6)	CO4
	b.	What is 2-SAT problem? Discuss the randomized algorithm for the same	(6)	CO5
5.		Answer any one of the following-	(1×6=6)	
	a.	Explain Euler cycle and Euler path problem. What is the class of this problem? Explain it by taking suitable examples.	(6)	CO4
	b.	Implement an algorithm for Knapsack problem using NP-Hard Approach.	(6)	CO5