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MID TERM EXAMINATIONS – December 2022

Programme	:	**B.Tech.**	Semester	:	**Winter 2022-23**
Course Title/ Course Code	:	**Design and Analysis of Algorithms/CSE3004**	Slot	:	**D11+D12+D13**
Time	:	**1 ½ hours**	Max. Marks	:	**50**

Answer all the Questions

Q.No.	Sub. Sec.	Question Description	Marks
1		Interpret the statement "NP-Complete (NPC) problems are problems that are present in both the NP and NP-Hard classes". Explain the relationship between class P, NP, NP-complete and NP hard problem with example.	**10**
2	(a)	Interpret the statement "If a problem A is NP-Complete, there exists a non-deterministic polynomial time algorithm to solve A". Discuss the non-deterministic polynomial time algorithm with an example.	**5**
	(b)	"If problem Y can be reduced to problem X in polynomial time". Illustrate the above sentence with example. Explain the role of reduction.	**5**
3		Interpret the statement "Dynamic Programming is mainly an optimization over plain recursion". The matrices have size 3 x 2, 2 x 4, 4 x 2, 2 x 5. Find the least multiplication operation and the sequence combination to be performed.	**10**
4		"A greedy algorithm is an approach for solving a problem by selecting the best option available at the moment". Explain the above statement with suitable example. Apply Huffman codding to compute the compressed length of the given message BCAADDDCCACACAC,	**10**
5		Explain Naïve string-matching algorithms and give an example to solve using Naïve string-matching algorithm.	**10**

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