2018 Scheme

1	N	T							

NITTE EDUCATION TRUST | NITTE MEENAKSHI INSTITUTE OF TECHNOLOGY

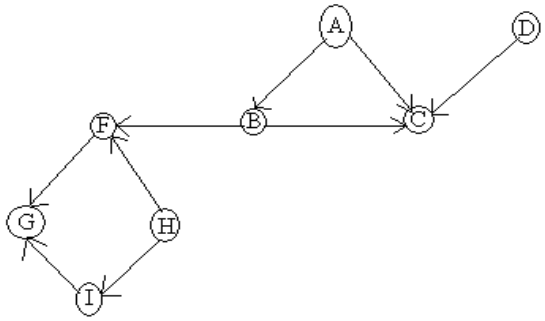
(An Autonomous Institution | Accredited with 'A+' Grade by NAAC | NBA | Approved By UGC | AICTE | Govt. of Karnataka | Affiliated to VTU, Belagavi)
Yelahanka, Bangalore – 560 064

KNOWLEDGE • CHARACTER • UNITY

Department of Computer Science and Engineering

ONLINE MID SEMESTER EXAMINATION-I

Course Title with code	DESIGN AND ANALYSIS OF ALGORITHMS (18CS42)	**Maximum Marks**	**30 Marks**
Date and Time	01-06-21 2:00 PM TO 3:00 PM	**No. of Hours**	1.0 HR
Course Instructor(s)	RAMYA.SRIKANTESWARA, DR. SUJATHA JOSHI, KAVYA.B. S		
Instructions to Students			
1. Answer any **two full questions.** 2. Any missing data may assume suitably.			

Q. No	Question	MAX MARKS	CO	BL	PO and PSO
1. a	A peasant finds himself on a riverbank with a wolf, a goat and a cabbage. He needs to transport all three to the other side of the river in his boat. However, the boat has room for only the peasant himself and one other item. In his absence the wolf would eat the goat, and the goat would eat the cabbage. Describe the various stages of algorithm design and analysis process with the help of a diagram for the given problem.	8	1	L2	PO:1,2,3 PSO: 2
1. b	"Medcross" a hospital in a city issued tokens for vaccination. The numbers were displayed in sequential order. A token with token number 23 was issued twice according to the office staff. Design an algorithm to check the distinctiveness of the tokens. Analyze the algorithm for the worst case of inputs.	7	4	L3	PO:1,2,3 PSO: 1,2
2. a	The map of Rajasthan has 8 cities marked as places for tourism as shown in figure 2a. The edges depict the connectivity paths between the cities. Topologically sort the following graph shown below starting at city "A" using i) DFS method ii) Source removal method  Figure 2a : Map of Rajasthan , nodes depicting cities.	8	3	L3	PO:1,2,3 PSO: 1,2
2. b	Determine the number of character comparisons that will be made by the brute force algorithm in searching for the pattern "GANDHI" in the text "THERE_IS_MORE_TO_LIFE_THAN_INCREASING_ITS_SPEED". Design an algorithm for the pattern searching problem, that uses Brute force approach.	7	2	L4	PO:1,2,3 PSO: 1,2

3. a	Navya and Alisha want to challenge each other for the number of options they get in selecting a game out of 5 games played over five days. They can play one game each day. They cannot repeat any game over five days. Initially Navya has challenged Alisha, help Navya to win the challenge. To calculate the number of options, design an algorithm for finding factorial of a number. Describe the general plan for analyzing such algorithms. Analyze the recurrence equation using backward substitution.	8	4	L3	PO:1,2,3 PSO: 1,2
3. b	A placement drive requires the student's percentage details of CSE Department sorted in descending order. Design an insertion sort algorithm to sort the percentage in *descending* order to help in placement drive. Give the trace for the example 98,86,67,54,73,95. Analyze the algorithm for the worst case of inputs.	7	2	L5	PO:1,2,3 PSO: 1,2

Faculty Signature	Course Co-Ordinator/Mentor Signature	HoD Signature