Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

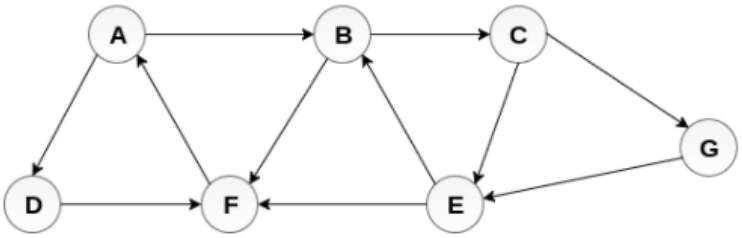
(A constituent unit of MAHE, Manipal)

SEVENTH SEMESTER BTECH. (E & C) DEGREE END SEMESTER EXAMINATION
FEBRUARY 2022
SUBJECT: DATA STRUCTURE AND ALGORITHMS (ECE – 4070)

TIME: 3 HOURS **MAX. MARKS: 50**

Instructions to candidates

- Answer **ALL** questions.
- Missing data may be suitably assumed.

Q.No.	Questions	M*	C*	A*	B*
1A.	Create a class called **STUDENT** which has the private members to store name, roll number and grade. Include member functions to *get_info()*, *print_info()* and get_*max()* to perform read, display and find the objects having highest grade. Write a complete C++ program to create array of pointers to store **"N"** STUDENT objects and display student information having highest grade. Use pass by reference using pointers to pass objects to member functions.	4			
1B.	Consider the graph shown in Figure 1B. The Breadth First Search algorithm is implemented using Queue data structure. The source vertex is "A" and lexicographic ordering is assumed for the edges emanating from each vertex. Determine the minimum path form node "A" to "E". Trace the queue status after every steps and also write the adjacency list.  Figure. 1B	3			
1C.	Construct a Binary Search Tree (BST) 200, 100, 300, 90,150,400,250,120, 180 in the order of the given values for the initial empty tree. How do you construct a threaded binary tree? Using the same convert the BST drawn by you into the threaded binary tree.	3			
2A.	Write an interactive program to a) input two polynomial b) display the polynomial 3) add two polynomial using singly linked list	4			
2B.	Convert the following Infix expression into Postfix form. Show all the steps clearly and also trace the stack content after every step. A + (B /C + (D - E * F) ^ G) * H	3			
2C.	Describe the Insertion Sort Algorithm and trace the steps of insertion sort for sorting the list -13, 19, 33, 25,29, 38,20	3			

M*--Marks, C*--CLO, A*--AHEP LO, B* Blooms Taxonomy Level