

Code No: Z – 16 – 2015

FACULTY OF ENGINEERING & TECHNOLOGY
S.E. (CSE/IT) (Rev.) Examination
MAY/JUNE, 2015

Data Structure Using C

Time: Three Hours

Max. Marks: 80

“Please check whether you have got the right the question paper”

- Note:
- Q. No. 1 from Section A and Q. No. 6 from Section B are compulsory.*
 - Assume suitable data if necessary.*
 - Solve any two questions from each section from remaining questions.*

SECTION-A

- Q.1 Solve any five of the following 5x2=10
- What is data structure? List any two linear data structure.
 - Show that ' Pointers can be dangerous'.
 - Define algorithm. Write any two criterias which must be satisfied by any algorithm.
 - What is a structure?
 - Give representation of multidimensional array.
 - List drawbacks of sequential representation.
 - Explain circular queue full and circular queue empty condition.
 - Give circular list representation of polynomial : $3x^{14} + 2x^8 + 1$.
- Q.2 (a) What is the necessity of an ADT? Explain functions necessary to create an ADT. Create an ADT for Natural numbers to perform operations : IsZero, Add. 08
- (b) Write C program to implement queue using dynamic array. 07
- Q.3 (a) Explain structure and union with syntax and example. 08
- (b) Convert given expression into postfix form and evaluate it using stack. $2+3*4$. 07

P.T.O.

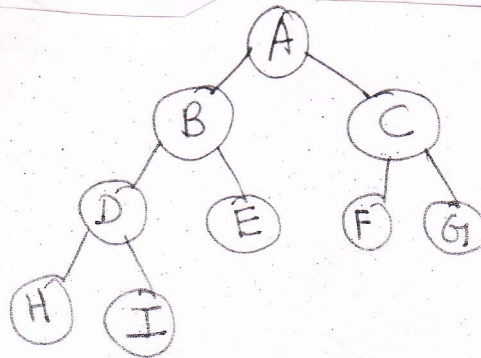
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- Q.4 (a) Write program in C for sorting elements of array in ascending order. 08
(b) What is Performance Analysis? Explain criterias use to analyse any algorithm. 07
- Q.5 (a) Write C function to invert a singly linked list. 08
(b) Explain multiple stack and queue. 07

SECTION-B

- Q.6 Solve any five. 5x2=10
- (a) Define forest. Give example.
(b) Write two properties of binary tree.
(c) Define graph. Give example of directed and undirected graph.
(d) Define binomial heap.
(e) What is splay tree? What are its two types?
(f) How to find balance factor in AVL tree? Give example.
(g) Write two properties of Red-Black tree.
(h) Construct threaded binary tree corresponding to given binary tree.



- Q.7 (a) How to represent a tree using 08
(i) List representation.
(ii) Left child right sibling representation. Give example.
(b) Explain Fibonacci heap with example. 07
- Q.8 (a) Define height - balanced tree. Assume that insertions are made in the order mars, mercury, Jupiter, Earth, Venus, Saturn. 08
(b) Write an ADT Graph. 07

Contd....3..

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- Q.9 (a) Suppose we have following key values 7, 16, 49, 82, 5, 31, 44 construct Max heap. **08**
- (b) Define pairing heap. Explain all operations on pairing heap with example. **07**
- Q.10 (a) Show the possibly binary search tree for key set $(a_1, a_2, a_3) = (2, 6, 8)$ with equal probability $P_i = q_i = \frac{1}{7}$. **08**
- (b) Define selection tree. Explain winner and loser tree. **07**
