

M.Sc. 4th Semester Examination, 2015

**APPLIED MATHEMATICS WITH OCEANOLOGY  
AND COMPUTER PROGRAMMING**

*( Data Structure and Design and  
analysis of Algorithms )*

PAPER — MTM - 402

( Unit – 1 )

*Full Marks : 25*

*Time : 1 hour*

*The figures in the right-hand margin indicate marks*

1. Answer any *two* questions : 2 × 2
- (a) Explain  $\Omega$  (Big-Omega) notation with its use.
  - (b) Compare the data structure array and link list.
  - (c) What are the best case, average case and worst case time complexities of binary search ?

( Turn Over )

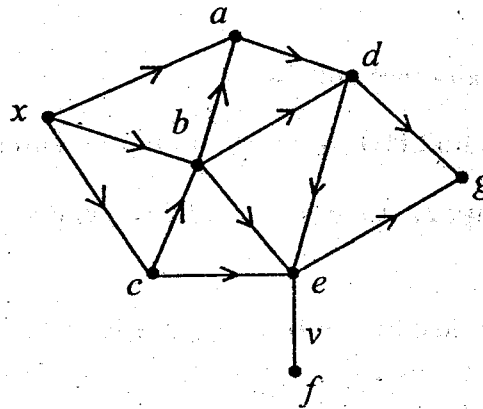
2. Answer any *four* questions : 4 × 4

(a) Describe circular queue. What is its advantage over linear queue ? How can we add an element into a circular queue ? 4

(b) Find the time and space complexity of the insertion sort technique. 4

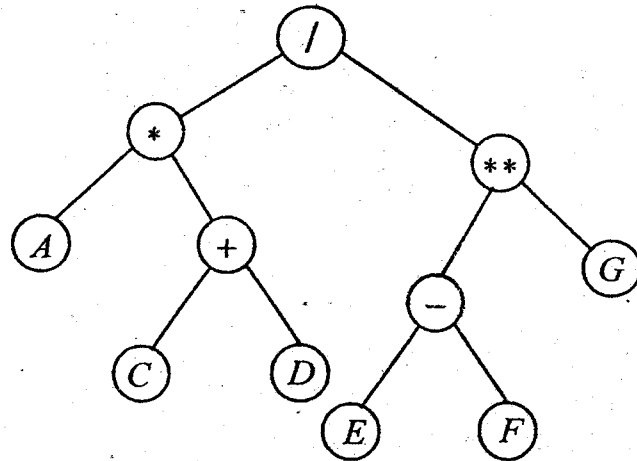
(c) Write an algorithm to add two polynomials using only two circular linear link list. 4

(d) Find the DFS tree of the following graph starting from the vertex *x*. 4



( 3 )

- (e) What are results of pre-order, post-order traversal of the following tree ? 4



- (f) Write an algorithm to evaluate a postfix expression. 4

[ *Internal Assessment* : 5 Marks ]