2015

M.Sc. Part–II Examination

APPLIED MATHEMATICS WITH OCEANOLOGY AND COMPUTER PROGRAMMING

PAPER—VI

Full Marks : 50

Time : 2 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Group–A

1. Answer any *two* questions : 2×5

(a) Describe general register machines with block diagram.

(b) Explain decoders. Construct a 3-to-8 decoder using two 2-to-4 decoders.

(c) Discuss about the branch instruction and subroutine call of program at the time of program execution.

2. Answer any *three* questions : 3×5

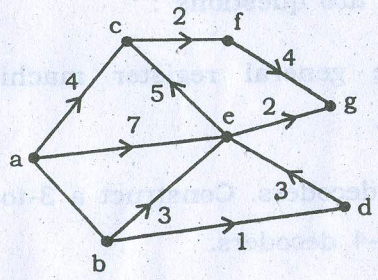
(a) What do you mean by a linked list ? Write algorithms to insert a node to the linked list and to remove a node from the linked list.

(b) Define stack. Write an algorithm to store a set of real numbers into a stack and find their sum.

(c) Define heap. Write an algorithm to sort a set of real numbers using heap sort.

(d) Explain DFS and BFS. What are the differences between them ?

(e) Use Dijkstra's algorithm to find the shortest distance between the vertices a and g in the following digraph :



3. Answer any *two* questions : 2×5

(a) Explain the following terms in connection with data flow :

simplex, half-duplex and full-duplex.

(b) Write a note on network topologies.

(c) Which services are available by a PC when it is connected on the Internet ? Describe them briefly.

4. Answer any *three* questions : 3×5

(a) Explain round robin scheduling.

(b) Explain operating system as an resource manager.

(c) Solve the producer-consumer problem using semaphores.

(d) Explain the following terms in connection with files :

open, close and rename.

(e) What are the rules for naming a file ? Which types of files are used in an operating system ?

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