DDE/II/A.MATH/VIA/13

M.Sc. Part-II Examination, 2013

APPLIED MATHEMATICS WITH OCEANOLOGY AND COMPUTER PROGRAMMING

PAPER– VI

Group – A

Full Marks : 50

Time : 2 hours

The figures in the right-hand margin indicate marks

1. Answer any *two* questions : 5 × 2

(*a*) Explain the organization of a stored program computer system with a block diagram.

(*b*) What do you mean by decoder ? Construct a 3-to-8 decoder using two 2-to-4 decoders.

(*c*) Explain the following memories :

(*i*) Cache memory
(*ii*) Virtual memory
(*iii*) Primary memory.

2. Answer any *three* questions : 5 × 3

(*a*) Define infix, prefix and postfix expressions. Convert the following infix expression into prefix and postfix :

$$A + B * C - (D + E) * C$$

(*b*) Write an algorithm to create a linked list containing *n* numbers and find their sum.

(*c*) Write an algorithm for binary search. Write its time complexity. What are the advantages and disadvantages of the proposed algorithm ?

(*d*) Write an algorithm to arrange a set of real numbers using heap sort.

(*e*) Write Dijkstra algorithm to find the shortest distances from a specified vertex to all other vertices.

3. Answer any *two* questions : 5 × 2

(*a*) What are the advantages of networks ? What are LAN and WAN ? What are their goals ? Explain network protocols.

(*b*) Write short notes on workstation, server, LAN cables, LAN adapter card.

(*c*) (*i*) Explain the following terms in connection with data flow :

simplex, half-duplex and full-duplex

(*ii*) What are the rules to numbering and naming a computer in the Internet ?

4. Answer any *three* questions : 5 × 3

(*a*) Explain round robin scheduling.

(*b*) Explain operating system as an extended machine.

(*c*) Explain the following directory operations :

delete, readdir, rename, closedir, create.

(*d*) How a file can be organized in computer memory ? Explain the methods.

(*e*) Solve the producer-consumer problem using semaphores.
