UG/II/CSC/H/III/15

2015

COMPUTER SCIENCE

[Honours]

PAPER – III

Full Marks : 90

Time : 4 hours

The figures in the right-hand margin indicate marks

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

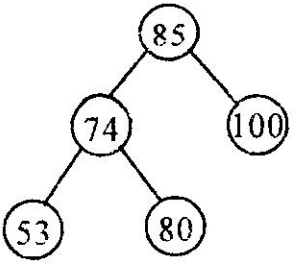
Illustrate the answers wherever necessary

GROUP – A

[Long answer Type Questions]

Answer any **two** questions : 15 × 2

1. (*a*) Using LL rotation techniques, insert 58 into following AVL search trees.



5

(*b*) What is multiprogramming ? How does it differ from multiprocessing ? 3

(*c*) Write the difference between paging and swapping. 4

(*d*) Define Long-term, short-term and Medium term scheduler. 3

2. (*a*) Sort the following item using selection sort

77, 33, 44, 11, 88, 22, 66, 55 4

(*b*) What is the difference between an array and a linked list ? 3

(*c*) Define the term dqueue. What operations can be done on a dqueue ? 1 + 1

(*d*) How is a circular queue implemented in a linear array ? 3

(*e*) Define binary search tree. Construct BST using 1, 5, 7, 2, 9, 4, 3 items. 1 + 2

3. (*a*) Define Polymorphism with example. Give examples of operator overloading and function overloading. 2 + 4

(*b*) Differentiate between Testing and Debugging. 4

(*c*) Define system. Why is system analysis necessary ? 2 + 3

GROUP – B

[Semi-Long answer Type Questions]

Answer any **five** questions : 8 × 5

4. (*a*) What do you mean by safe state ? 2

(*b*) Define virtual memory. 2

(*c*) What is semaphore ? What are its usefulness ? 4

5. (*a*) Describe the Belady's anomaly in connection with the page replacement algorithm using an example. 5

(*b*) Explain the difference between internal and external fragmentation. 3

6. (*a*) What is hashing ? Write down the advantages and limitations of collision resolution by chaining. 2 + 3

(*b*) Write an algorithm for inorder traversal of binary tree. 3

7. (*a*) Convert the following expression into postfix notation

$$a - (b*(c/d) + (e/f))$$ 2

(*b*) Describe the characteristic of B+ tree. 2

(*c*) What is the problem of linear queue implementation using array ? How can it be solved ? 2 + 2

8. (*a*) Describe the difference between open -system and closed system with an example. 3

(*b*) What are the differences between DFD and structure chart ? 3

(*c*) What you understand by 'Quality Assurance'. 2

9. Distinguish between the following terms : 4 × 2

(*i*) Object and classes

(*ii*) Data abstraction and data encapsulation.

10. (*a*) For a binary tree define-internal and external path length and establish a relation between them. 5

(*b*) What is starvation ? How this problem is resolved ? 2 + 1

11. (*a*) What do you mean by logical address space ? How deos it differ with physical address space ? 2 + 2

(*b*) What are the merits and demerits of using Inline functions. 2 + 2

GROUP – C

[Short answer Type Questions]

Answer any **five** questions : 4 × 5

12. What is overflow and underflow ? Illustrate your answer. 2 + 2

13. Describe the necessary conditions for deadlock. 4

14. Why is a life-cycle needed for the development of information system ? 4

15. Explain different access specifier in a class ? 4

16. Draw all the possible non similar trees T where T is binary tree with 4 external nodes. 4

17. Write the difference between spooling and buffering. 4

18. Describe the different types of feasibility studies done before developing a project. 4

19. (*a*) With a diagram describe the structure of doubly linked list.

    (*b*) What do you mean by recursion ? 2 + 2