2017

COMPUTER SCIENCE

[Honours]

PAPER – III

Full Marks : 100

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

[OLD SYLLABUS]

[Long -Answer Type Questions]

Answer any **two** questions :   15 × 2

GROUP – A

1. (a) Convert $A + (B^* C - (D/E \uparrow F) {}^*G)^*H$ into postfix expression showing stack status of every step in tabular from.   7

(b) What is the worst case complexity of searching an element in binary search tree ? What are the advantages of hashing than any other search methods.   2 + 2

(c) Define Heap. Give two application of heap structure.   2 + 2

2. (a) Describe producers and consumers problem in brief and propose a solution to solve the program.   5 + 3

(b) What is dynamic binding ? When do we use it ? Explain with an example.   7

3. (a) What type of fragmentation is observed in paging. Describe the difference between internal and external fragmentation.   1 + 3

(b) What do you understand by virtual memory ? What is the relationship between virtual memory and real memory ? What is batch processing ?   1 + 2 + 2

(c) What do you mean by SDLC ? Describe SDLC model in brief. 6

GROUP – B

[Semi-Long -Answer Type Questions]

Answer any five questions : 8 × 5

4. (a) Describe the difference between multipro-gramming and multitasking. What is segmentation ? 2 + 2

(b) Describe the simple paging technique with it's disadvantages. 4

5. (a) What is Process Control Block (PCB) ? Explain all its components. 2 + 3

(b) Explain the following memory allocation algorithm (i) First-fit (ii) Best-fit (iii) Worst-fit. 3

6. (a) Explain operator overloading with an example. 4

(*Turn Over*)

(b) Distinguish between data abstraction and data encapsulation.   4

7. (a) What is copy constructor ? Give example. 2 + 2

    (b) Name any two hashing functions. Describe only one collision resolution technique briefly.   2 + 2

8. (a) Explain the difference between busy waiting and blocking. Define the difference between preemptive and non-preemtive scheduling.   2 + 2

    (b) What do you mean by constructor ? List the characteristics of a constructor.   4

9. Distinguish between DFS and BFS. Indicate their time complexities.   6 + 2

10. (a) What are the functions of Quality Assurance Group ?   4

(*b*) Distinguish between Quality control and Quality Assurance. 4

11. (*a*) What are the conditions of deadlock ? 4

(*b*) Explain resource allocation graph algorithm for deadlock avoidance. 4

GROUP – C

[Short Answer Type Questions]

Answer any five questions : 4 × 5

12. Define virtual function with the help of a C++ program. 4

13. Distinguish between software verification and software validation. 4

14. Explain state transition diagram of a process. 4

15. What do you mean by black box testing ? How white box testing differs with it ? 2 + 2

16. What are the merits and demerits of using Inline functions.   2 + 2

17. What is semaphore ? What are its usefulness ?   4

18. What is race condition ? Why page size are always power of 2 ?   2 + 2

19. Point out the difficulties in using linear queue. How can the problem be removed using other data structure (3) ?   2 + 2

[*Internal Assessment* : 10 Marks]

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