UNIVERSITY OF NORTH BENGAL

B.Sc. Honours Part-II Examination, 2021

COMPUTER SCIENCE

PAPER-III

Full Marks: 100

ASSIGNMENT

The figures in the margin indicate full marks.
All symbols are of usual significance.

Answer any *four* questions   25×4 = 100

1. (a) What is parameter passing? Discuss the differences among call-by-value and call-by-reference and call-by-name with proper example.   1+9

   (b) What is hashing? Briefly discuss about different Hashing function.   1+4

   (c) What is deadlock? Explain with diagram. What are the necessary conditions for deadlock? How deadlocks can be prevented?   3+3+4

2. (a) Write a short note on three page replacement techniques. What is thrashing and what is cause of thrashing?   6+4

   (b) What is a variable? Why it is necessary to initialize a variable, explain with example.   5

   (c) In C Programming Language what are structure and union? Discuss their difference with code snippets.   5

   (d) Write a short note on assembler.   5

3. (a) How to convert a tree to a binary tree? Explain with an example.   5

   (b) Write the algorithm for binary search. What are the advantages and drawbacks of Binary Search?   3+2

   (c) What is CPU Scheduler? What are different Scheduling Criteria?   1+4+5

   Describe Shortest Job First (SJF) CPU scheduling algorithm. Calculate the average waiting time for the given processes using SJF scheduling algorithm.

Process	Arrival Time	Burst Time
P_1	0	7
P_2	1	5
P_3	2	9
P_4	3	6

   (d) Discuss about different phases of a compiler.   5

4. (a) What is Deterministic finite automaton and Non deterministic finite automaton? Construct a DFA that accept the sets consisting of all strings with at least one *a* and exactly two *b*'s. For $\sum = \{a, b\}$.   6+4

  (b) What are operators? Discuss about different types of operators that are available in C.   10

  (c) What are the differences between Array and Linked List?   5

5. (a) What is operator precedence and associativity of operators in the C Programming Language? Discuss with proper example.   5

  (b) What is the critical section problem in operating system? Discuss about various requirements that a solution to the critical section problem must satisfy. Discuss about semaphores.   3+3+4

  (c) Discuss the difference between preemptive and non-preemptive scheduling algorithms with proper example.   5

  (d) How infix expression is converted to a postfix expression? Explain with example.   5

6.   Write short notes on the following topics:

  (a) Segmentation   5

  (b) Virtual Memory   5

  (c) Cross-Compilers   5

  (d) Turing Machine   5

  (e) Process Control Block (PCB).   5

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