



**UNIVERSITY OF NORTH BENGAL**

B.Sc. Honours Part-II Examination, 2020

**COMPUTER SCIENCE**

**PAPER-III (Revised New Syllabus)**

Time Allotted: 2 Hours

Full Marks: 50

*The figures in the margin indicate full marks.*

1. Answer any **three** questions: 10×3 = 30
  - (a) Describe the Bounded-buffer problem and give a solution for the same using semaphore. Write the structure of producer and consumer processes. 10
  - (b) Explain the different parameter passing techniques with suitable example. 10
  - (c) What is critical section? Give a two process solution to critical section problem. Justify your solution. 10
  - (d) Explain the different phases of a typical Compiler in details. 10
  - (e) Explain the different looping controls available in C with suitable example. 10
  - (f) Define Operating System. Discuss different types of operating system. 10
  - (g) Explain the different criteria for language design. 10
  - (h) Explain Belady's anomaly often encountered in FIFO page replacement algorithm with the help of suitable example. 10
  - (i) Write down a program for matrix multiplication. Further explain the program. 10
  - (j) Write and explain the binary search algorithm with suitable example. 10
  - (k) Explain the Queue data structure with its use in computer. Further, write down the algorithm to create a queue and to perform different operations on a queue. 10
  - (l) What is paging? Why paging is needed? Further, explain the paging scheme with diagrammatic representation. 10
  - (m) Write down the algorithm to create and perform different operations in a doubly linked list. 10
  - (n) Explain the differences between structure and union in C with the help of suitable example. 10
  
2. Write short notes (any **four**): 5×4 = 20
  - (a) Stack data structure
  - (b) Preemptive Vs. Non-preemptive scheduling algorithm
  - (c) Binary Tree and its properties
  - (d) Process Control Block (PCB)
  - (e) Turing Machine
  - (f) Thrashing.

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