

**CDOE**  
**BACHELOR OF COMPUTER APPLICATIONS (CBCS-2018 COURSE)**

**B.C.A. Sem-III : WINTER :- 2021**  
**SUBJECT: OPERATING SYSTEMS**

**Day : Tuesday**  
**Date 15-02-2022**

**W-18996-2021**

**Time : 02:00 PM-05:00 PM**  
**Max. Marks: 70**

**N.B.**

- 1) Attempt any **FOUR** questions from Section – I and Attempt any **TWO** questions from Section – II.
- 2) Answers to both the sections should be written in the **SAME** answer book.
- 3) Figures to the right indicate **FULL** marks.

**SECTION - I**

- Q.1** Define operating system. Discuss various structures of it. **(10)**
- Q.2** What is scheduling? Why is it necessary? Discuss various types of schedulers in brief. **(10)**
- Q.3** What do you mean by fragmentation? Differentiate between internal fragmentation and external fragmentation. **(10)**
- Q.4** Explain in detail busy-wait implementation of semaphore. **(10)**
- Q.5** Define file. Explain different file access methods with its advantages and disadvantages. **(10)**
- Q.6** Write short notes on any **TWO** of the following: **(10)**
- a) Device controller
  - b) Disk structure
  - c) Graphical user interface

**SECTION - II**

- Q.7** Consider the following case. **(15)**

| Processes | In time (am.) | Run time (min.) |
|-----------|---------------|-----------------|
| P1        | 10.00         | 12              |
| P2        | 10.05         | 6               |
| P3        | 10.07         | 3               |
| P4        | 10.11         | 7               |

Calculate average waiting and average turnaround time in case of following process management algorithms:

- i) FCFS                      ii) SJF                      iii) SRTN

- Q.8** Consider following page reference string. **(15)**  
0, 3, 2, 1, 3, 4, 7, 3, 2, 1, 0, 3, 2, 1, 4, 5  
Consider the memory with four page frames and all frames are empty initially. Find out total number of page faults in case of following algorithms.  
i) FCFS                      ii) LRU
- Q.9** What is deadlock? What are the four necessary conditions for a deadlock to occur? How deadlocks are detected and recovered? **(15)**

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