



QP – 458

III Semester B.C.A. Examination, April/May 2021
(CBCS) (Y2K14 Scheme) (F+R)
COMPUTER SCIENCE
BCA 305 : Operating Systems

Time : 3 Hours

Max. Marks : 100

Instruction : Answer all Sections.

SECTION – A

I. Answer any ten questions :

(10×2=20)

- 1) What is an operating system ? Mention any two functions of operating system.
- 2) Define scheduler and dispatcher.
- 3) Discuss race condition.
- 4) Mention the necessary conditions for deadlock.
- 5) What are overlays ?
- 6) Explain paging.
- 7) Discuss Belady's anomaly.
- 8) What is external fragmentation ?
- 9) What is rotational latency ?
- 10) What do you mean by Trojan Horse ? Give an example.
- 11) Define hit ratio.
- 12) Mention any four types of files.

SECTION – B

II. Answer any five questions :

(5×5=25)

- 13) Explain real time operating system.
- 14) Discuss about process control block.
- 15) Explain Readers-Writers problem.

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- 16) Explain PCB with a neat diagram.
- 17) Explain first-fit, best-fit and worst-fit schemes for allocation of memory. With the help of an example compare their performance.
- 18) What is thrashing ? Discuss different techniques to handle thrashing.
- 19) With a neat diagram explain linked allocation.
- 20) Describe user authentication.

SECTION - C

III. Answer **any three** questions :

- 21) Consider the set of 5 processes whose arrival time and burst time are given below :

(3×15=45)

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Process ID	Arrival time	Burst time
P1	0	9
P2	1	4
P3	2	2
P4	4	3
P5	5	1

Let the time quantum = 3 units. Draw Gantt's chart and then calculate average waiting time and turn around time for FCFS, SJF (preemptive) and Round Robin algorithms.

- 22) a) Explain deadlock avoidance using Banker's algorithm. 8
- b) What is semaphore ? Discuss different types of semaphore. 7

- 23) a) Consider the following page reference string :

1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6

How many page faults would occur for LRU and optimal page replacement algorithms assuming three frames and all frames are initially empty ?

- b) Describe how demand paging technique is used to implement virtual memory. 7

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- 24) a) Explain different file access methods. 8
- b) Discuss about single level and two level directory structure. 7
- 25) a) Compare SCAN and CSCAN disk scheduling algorithms. 8
- b) What is virus ? Explain different types of viruses. 7

SECTION - D

IV. Answer **any one** question : (1×10=10)

- 26) Write short notes on : (10×2=20)
 - a) Inter-process communication. 5
 - b) Resource allocation graph. 5
- 27) Describe : (10×2=20)
 - a) Security mechanism in Linux. 5
 - b) Segmentation technique for memory management. 5

SECTION - B

II. Answer any five questions : (5×5=25)

- 13) Explain real time operating system.
- 14) Discuss about process control block.
- 15) Explain Readers-Writers problem.