QP – 458

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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.

P.T.O.

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 : **(3×15=45)**

21) Consider the set of 5 processes whose arrival time and burst time are given below : **15**

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 : **8**

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**

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 :

a) Inter-process communication. **5**

b) Resource allocation graph. **5**

27) Describe :

a) Security mechanism in Linux. **5**

b) Segmentation technique for memory management. **5**
