Odd Semester, 2020

(Held in March, 2021)

COMPUTER APPLICATION

(Honours)

(BCA–303)

(Operating System and Introduction to LINUX)

Marks : 45

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer *any* **one** from each Unit

UNIT—I

1. *(a)* Explain the different roles of operating system. 5

(b) What are system calls? Explain the different categories of system calls with example. 1+3=4

2. *(a)* Define essential properties of the following types of operating system : 2×3=6

(i) Batch operating system

(ii) Interactive operating system

(iii) Time sharing operating system

(b) Explain the concepts of open source and interface. 3

UNIT—II

3. *(a)* Describe process states with the help of process transition diagram. 3

(b) Explain FCFS scheduling algorithm. Find the average turn around time and average waiting time for the processes given in the table below : 2+4=6

Process	*CPU burst time* (in ms)
P_1	24
P_2	3
P_3	3

4. *(a)* What is the criterion used to select the time quantum in case of round-robin scheduling algorithm? Explain it with a suitable example. 5

(b) Explain the concept of 'process' and describe the contents of a process control block (PCB). 4

UNIT—III

5. *(a)* Explain three requirements that a solution to critical-section problem must satisfy. 4

(b) What are semaphores? Explain the solution to producer-consumer problem using semaphores. 2+3=5

6. *(a)* Explain the terms 'critical section' and 'mutual exclusion'. 2+2=4

(b) Explain the dining philosophers problem. 5

UNIT—IV

7. *(a)* Consider a swapping system in which memory consists of the following hole sizes in memory order :

10 KB, 4 KB, 20 KB, 18 KB, 7 KB, 9 KB, 12 KB and 15 KB

Which hole is taken for successive segments request of *(i)* 12 KB, *(ii)* 10 KB and *(iii)* 9 KB for first fit? Repeat the question for best fit, worst fit and next fit. 4

(b) Explain locality of reference. What is working set? Define thrashing. 2+2+1=5

8. *(a)* What is the usefulness of TLBs in paging schemes? What fields are found in these tables? 3+2=5

(b) Consider the reference stream 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6. How many page faults while using FCFS and LRU using 2 frames? 4

UNIT—V

9. *(a)* Write a shell script to find the factorial of a number. 5

(b) Write short notes on the linux shell with reference to the C shell. 4

10. *(a)* Write a shell script that takes 4 file names as command line arguments. Check if each file exists and only then display its contents otherwise display an error message. Display appropriate error messages. 5

(b) Explain with syntax and examples the following commands : 2×2=4

(i) grep

(ii) find

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