

**U.G. 3rd Semester Examination - 2021****BCA****Course Code : BBCACCHC302****Course Title : Principles of Operating System**

Full Marks : 30

Time : 2 Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*1. Answer any **ten** questions:  $1 \times 10 = 10$ 

- Define spooling.
- What is the differences between logical and physical address?
- What is thread?
- Define the term 'time sharing'.
- Consider the following segment table :

Segment	Base	Length
0	560	250
1	1540	15

What are physical address for the following logical address?

- 0,220
- 1,25

- What is the main difference between internal and external fragmentation?
- What is kernel?
- What is dispatch latency?
- Define critical section.
- What is a device queue?
- What is the use of long-term scheduler?
- What is virtual memory?
- What are the advantages of multiprocessor system?
- What is starvation?
- What is track and sector of a hard disk?

2. Answer any **five** questions:  $2 \times 5 = 10$ 

- Why are page size always a power of 2?
- Suppose that a secondary storage with 200 cylinders numbered from 0 to 199, and the current head position is 143. The queue of the request :  
86, 147, 91, 177, 94, 150, 102, 175, 130.

What is the total number of head movement required if we use SSTF algorithm and also find the average head movement.

- c) Define race condition.
- d) Distinguish between preemptive and non-preemptive scheduling.
- e) What are the different types of Multiprocessing?
- f) What are the functions involved when a process is dispatched to CPU?
- g) What is Process Control Block (PCB)? Explain.
- h) What is best-fit memory allocation technology?

3. Answer any **two** questions:  $5 \times 2 = 10$

a) i) Consider the following snapshot of a system:

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	2	0	0	1	4	2	1	2	3	3	2	1
P1	3	1	2	1	5	2	5	2				
P2	2	1	0	3	2	3	1	6				
P3	1	3	1	2	1	4	2	4				
P4	1	4	3	2	3	6	6	5				

Illustrate that the system is in a safe state by demonstrating an order in which the processes may complete.

ii) What is resource allocation graph?  $4 + 1 = 5$

- b) Five jobs A through E, arrive at the same time. They have estimated running times of 8, 6, 2, 4, and 7 min. Their priorities are 3, 5, 2, 1 and 4 respectively, 5 being the highest priority.

For each of the following scheduling algorithms determine the mean process turnaround time.

(i) SJF (ii) Priority scheduling  $2\frac{1}{2} + 2\frac{1}{2} = 5$

- c) Using frame size 3 and the following page references –

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

calculate the total number of page fault for –

i) LRU page replacement algorithm

ii) Optimal page replacement algorithm

$$2\frac{1}{2} + 2\frac{1}{2} = 5$$