

U.G. 4th Semester Examination - 2021**COMPUTER SCIENCE****[HONOURS]****Course Code : COM.SC-H-CC-L-408****(Operating System)**

Full Marks : 30

Time : 1½ 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.***GROUP-A**

1. Answer any **five** questions : 2×5=10
- a) Write at least two advantages of virtual memory concept.
 - b) Differentiate between logical and physical address.
 - c) Why page size is always power of 2?
 - d) What is compaction?
 - e) What do you mean by PCB?
 - f) Why disk scheduling is important?
 - g) Differentiate between multiprogramming and multitasking.
 - h) Define mutual exclusion.

*[Turn over]***GROUP-B**Answer any **two** questions:

5×2=10

- 2. Explain different states of a process with a neat diagram.
- 3. Given the continuous memory partitions of 200K, 700K, 500K, 300K, 100K, 400K.
Apply first fit algorithm and best fit algorithm to place 315K, 427K, 250K, 550K page requests in the given order.
- 4. Explain indexed and linked list file allocation methods with their disadvantages.
- 5. What is deadlock? Explain Banker's algorithm. 1+4
- 6. Explain how mutual exclusion is implemented with semaphores.

GROUP-CAnswer any **one** question:

10×1=10

- 7.
 - a) Explain internal and external fragmentation problem with examples.
 - b) How logical to physical address mapping is performed in paging. 5+5

8. a) Consider the following:

Process	Arrival Time	Burst Time
P ₁	0.0	7
P ₂	2.0	4
P ₃	4.0	1
P ₄	5.0	4

Calculate average turnaround time and average waiting time for preemptive and nonpreemptive SJF scheduling. Also draw Gantt chart for the same.

- b) Explain the drawback of priority scheduling.
How we can overcome that? $(4+2)+(2+2)$

9. a) Explain the need of page replacement.

- b) Consider the following reference string:

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1

Find the number of page faults with FIFO, optimal page replacement and LRU with four free frames which are empty initially. Which algorithm gives the minimum number of page faults?
 $3+(2+2+2)+1$
