

U.G. 4th Semester Examination - 2020**COMPUTER SCIENCE****[HONOURS]****Course Code : CMSH-CC-L-408**

Full Marks : 60

Time : $2\frac{1}{2}$ 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.***GROUP-A**

1. Answer any **ten** questions : $2 \times 10 = 20$
- a) What is the difference between batch processing and multiprogramming?
 - b) What is critical section?
 - c) What is the function of dispatcher?
 - d) What is thrashing?
 - e) What is starvation?
 - f) What is real time operating system?
 - g) What is rotational latency?
 - h) What is preemption?
 - i) What is booting?

- j) What is race condition?
- k) What is nonmaskable interrupt?
- l) What is best fit allocation?
- m) What is swapping?
- n) What is encryption?
- o) What is daisy chain?

GROUP-BAnswer any **four** questions from the following: $5 \times 4 = 20$

2. What is system call? Discuss the types of system calls. $2+3$
3. What are the two models of interprocess communication? What are their strengths and weaknesses? $2+3$
4. a) What is the difference between paging and segmentation? 2
b) How monitors are used in process synchronization? 3
5. a) What are the benefits of multithreaded programming? 2
b) What is polling? How it is different from interrupt? $1+2$

[Turn over]

6. a) How internal fragmentation is different from external fragmentation? 3
b) What is the solution for external fragmentation? 2
7. What is deadlock? What are the necessary conditions for a deadlock to occur? 1+4

GROUP-C

Answer any **two** questions from the following: $10 \times 2 = 20$

8. a) A CPU generates 32-bit virtual address. The page size is 4KB. The processor has a translation look aside buffer (TLB) which can hold a total of 128 page table entries and is 4-way set associative. Calculate the minimum size of TLB tag.
- b) Using priority scheduling, find the average waiting time and turnaround time for the following set of processes, with length of the CPU burst time given in milliseconds:

<u>Process</u>	<u>Burst-Time</u>	<u>Priority</u>
P1	6	2
P2	12	4
P3	1	5
P4	3	1
P5	4	3

All processes are assumed to arrive at time 0.

- c) What is kernel? How user mode is switched to kernel mode? $3+4+(1+2)$
9. a) Draw and explain the process state diagram.
b) Discuss any two approaches to recover a system from deadlock.
c) A system has 3 processes sharing 4 resources. If each process needs a maximum of two units, then check if the system is in safe state. $5+3+2$
10. a) What are the major activities of an operating system with regard to file management?
b) How one time password provides security for authentication?
c) Suppose the disk drive has 200 cylinders. The order of request is 82, 170, 43, 140, 24, 16, and 190. The current position of read write head is at 50. Calculate the total seek time for:
i) FCFS
ii) SSTF
iii) SCAN $3+1+6$
11. Write short note on any **two** of the following: 5×2
a) Semaphore
b) Virtual Memory
c) NTFS
d) System Protection