GIET UNIVERSITY, GUNUPUR – 765022
M.C.A(First Semester) Examinations, March – 2023
MCA20103 – OPERATING SYSTEM

Time: 3 hrs   Maximum: 70 Marks

(The figures in the right hand margin indicate marks.)

PART – A   **(2 x 10 = 20 Marks)**

Q.1. Answer all questions

		CO#	Blooms Level
a.	Outline about virtual memory.	CO2	K2
b.	What are the various file operations?	CO3	K1
c.	Discuss the difference between symmetric and asymmetric multiprocessing	CO1	K2
d.	What is the use of Valid-Invalid Bits in Paging?	CO3	K3
e.	Distinguish between page and segment.	CO2	K3
f.	How to overcome busy waiting using Semaphore operations.	CO3	K2
g.	Define inter process communication (IPC).	CO1	K1
h.	What are the requirements that a solution to the critical section problem must satisfy?	CO3	K2
i.	Define: Mutual Exclusion	CO4	K1
j.	Identify what virtual machine is and what are the advantages virtual machines.	CO1	K3

PART – B   **(10 x 5 = 50 Marks)**

Answer *ANY FIVE* questions

		Marks	CO#	Blooms Level
2. a.	Write a shell program to input basic salary (BS). Find the TA=10% of BS, DA=15% of BS, HRA=20% of BS. Find total salary.	5	CO4	K3
b.	List the various services provided by operating systems.	5	CO1	K2
3.a.	Consider the following page reference string: 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 the optimal page replacement algorithm, assuming three frames and all frames are initially empty.	5	CO2	K4
b.	What is a Critical Section problem? Give the conditions that a solution to the critical section problem must satisfy.	5	CO3	K3
4. a.	Describe the contents of a process control block(PCB)	5	CO2	K3
b.	What are the advantages of inter-process communication (IPC)? How communication takes place in a shared-memory environment?	5	CO1	K2
5.a.	What is Deadlock? Explain Deadlock prevention & Avoidance.	5	CO4	K2
b.	Discuss the services provided by the operating system for efficient system operation.	5	CO1	K2
6. a.	Consider following set of processes with arrival time in milliseconds, CPU burst time (in milliseconds) and priority (0 is the highest priority) shown below.	5	CO1	K4

Process ID	Arrival Time (AT)	Burst Time(BT)	Priority
P1	0	11	2
P2	5	28	0
P3	12	2	3
P4	2	10	1
P5	9	16	4

Find Avg. waiting time using preemptive priority scheduling algorithm.

		Marks	CO#	Blooms Level
b.	Discuss in detail about file allocation methods.	5	CO3	K2
7.a.	Explain about the difference between internal fragmentation and external fragmentation.	5	CO2	K3
b.	Explain evolution of operating systems.	5	CO1	K2
8. a.	Consider the following page reference string: 1, 2, 3, 4, 1, 2, 5, 1, 2, 3, 4, 5. How many page faults would occur for the FIFO page replacement algorithms assuming three & four frames?	5	CO2	K4
b.	Discuss Mutual-exclusion implementation with test and set () instruction.	5	CO3	K2

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