VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD
B.E. (C.S.E. : CBCS) IV-Semester Main Examinations, January-2021
Operating Systems

Time: **2 hours**   Max. Marks: **60**

Note: Answer any NINE questions from Part-A and any THREE from Part-B

Part-A (9× 2 = 18 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	Which C library function do not directly correspond to a system call? Why? a) System b) Fork b) Exit d) Strlen	2	3	1	1,2

2.	What is the output of the following program for any value of 'a'
	
	 int main()
	 {
	    int a, pid;
	    pid=fork()
	    if (pid==0)
	      {
	        a=a+5;
	        printf ("u=%d\n", a);
	      }
	    else
	      {
	        a=a-5
	        printf("x==%d\n", a);
	      }
	 }
		2	3	1	1,2

3.	A 1000 KB memory is managed by using Variable partitions but no Compaction. It is currently has two processes of size 200KB and 260 KB. What is the smallest allocation request in KB that could be denied?	2	3	2	1,2
4.	Why Local page replacement is better compared to Global page replacement? Give reasons.	2	2	2	1,2
5.	A system is having 10 user process each requires 4 units of a resource R. What is the minimum number of R such that no deadlock will occur?	2	3	3	1,2
6.	What is a Critical section? Why process need to be synchronized to execute critical section?	2	2	3	1,2

		M	L	CO	PO
b)	A computer system uses the Bankers Algorithm to deal with deadlocks. Its current state is shown in table below, where P0, P1, P2 are process and X, Y,Z are resources type. Available = [2,2,0]	8	3	3	1,2

Process	Max			Allocation		
	X	Y	Z	X	Y	Z
P0	4	1	2	1	0	2
P1	1	5	1	0	3	1
P2	1	2	3	1	0	2

    a)   Show that the system can be in this state

    b)   What will the system do on a request by process P0 for one unit of resource type Y?

		M	L	CO	PO
16. a)	A Disk pack has 19 surfaces and storage area on each surface has an outer diameter of 33 cm and inner diameter of 22 cm. the maximum recording storage density on any track is 200 bits/cm and minimum spacing between tracks is 0.25 mm. Compute the capacity of the disk pack.	6	3	4	1,2
b)	Compute seek time for the following I/O reference string using FCFS, SSTF, and SCAN algorithms. Total number of cylinders= 5000, current position of read/write head= 245, previous position= 143, I/O reference string= 259,1679,916,1775,1509,130,1022	8	3	4	1,2
17. a)	Explain the methods to implement Access Matrix.	8	2	5	1,2
b)	Describe the role of loadable kernel modules in Linux operating system	6	2	5	1,2
18. a)	What are the services provided by the operating system? Explain in detail	6	2	1	1,2
b)	Consider a logical address space of 256 pages with a 4-KB page size, mapped onto a physical memory of 64 frames. i) How many bits are required in the logical address? ii) How many bits are required in the physical address?	8	3	2	1,2
19.	Answer any *two* of the following:				
a)	Explain the solution for Bounded-buffer problem with Semaphores	7	2	3	1,2
b)	Write the steps in transforming I/O request to hardware operation?	7	2	4	1,2
c)	Explain the Architecture of Android operating system. Why Android OS is suitable for Mobiles?	7	2	5	1,2

M: Marks;   L: Bloom's Taxonomy Level;   CO: Course Outcome;   PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	60%
2	Knowledge on application and analysis (Level-3 & 4)	40%
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	0

*****