

Reg.No. \_\_\_\_\_



**Karunya UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – Nov/Dec – 2016**

**Code : 14CS2037**  
**Sub. Name : Operating System**

**Semester : 2016-17 ODD**  
**Duration : 3hrs**  
**Max. marks : 100**

Q. No.	Questions				Course outcome	Marks
PART-A (40X1=40 MULTIPLE CHOICE QUESTIONS)						
1.	If no cycle exists in the resource allocation graph :				C1	
	a. then the system will not be in a safe state	b. then the system will be in a safe state	c. either a or b	d. None of Options		(1)
2.	If we preempt a resource from a process, the process cannot continue with its normal execution and it must be:				C1	
	a. aborted	b. rolled back	c. terminated	d. queued		(1)
3.	A process holding at least one resource and waiting to acquire additional resources held by other processes is called _____.				C1	
	a. Mutual exclusion	b. No Preemption	c. Hold and wait	d. Circular wait		(1)
4.	An edge from process $P_i$ to $P_j$ in a wait for graph indicates that :				C1	
	a. $P_i$ is waiting for $P_j$ to release a resource that $P_i$ needs	b. $P_j$ is waiting for $P_i$ to release a resource that $P_j$ needs	c. $P_i$ is waiting for $P_j$ to leave the system	d. $P_j$ is waiting for $P_i$ to leave the system		(1)
5.	Given a priori information about the _____ number of resources of each type that maybe requested for each process, it is possible to construct an algorithm that ensures that the system will never enter a deadlock state.				C1	
	a. Maximum	b. Minimum	c. Approximate	d. Average		(1)
6.	A state is safe, if :				C1	
	a. the system does not crash due to deadlock occurrence	b. the system can allocate resources to each process in some order and still avoid a deadlock	c. the state keeps the system protected and safe	d. All of these		(1)
7.	A system is in a safe state only if there exists a :				C1	
	a. safe allocation	b. safe resource	c. safe sequence	d. All of these		(1)
8.	The number of resources requested by a process :				C1	
	a. must always be less than the total number of resources available in the system	b. must always be equal to the total number of resources available in the system	c. must not exceed the total number of resources available in the system	d. must exceed the total number of resources available in the system		(1)
9.	For Mutual exclusion to prevail in the system :				C1	

	a. at least one resource must be held in a non sharable mode	b. the processor must be a uniprocessor rather than a multiprocessor	c. there must be at least one resource in a sharable mode	d. All of these		(1)
10.	Deadlock prevention is a set of methods :				C1	
	a. to ensure that at least one of the necessary conditions cannot hold	b. to ensure that all of the necessary conditions do not hold	c. to decide if the requested resources for a process have to be given or not	d. to recover from a deadlock		(1)
11.	Physical memory is broken into fixed-sized blocks called _____.				C1	
	a. frames	b. pages	c. backing store	d. None of the these		(1)
12.	The _____ table contains the base address of each page in physical memory.				C1	
	a. process	b. memory	c. page	d. frame		(1)
13.	_____ is the concept in which a process is copied into main memory from the secondary memory according to the requirement.				C2	
	a. Paging	b. Demand paging	c. Segmentation	d. Swapping		(1)
14.	Which algorithm chooses the page that has not been used for the longest period of time whenever the page required to be replaced?				C3	
	a. first in first out algorithm	b. additional reference bit algorithm	c. least recently used algorithm	d. counting based page replacement algorithm		(1)
15.	Which of the following page replacement algorithms suffers from Belady's Anomaly?				C3	
	a. Optimal replacement	b. LRU	c. FIFO	d. Both optimal replacement and FIFO		(1)
16.	A process refers to 5 pages, A, B, C, D, E in the order : A, B, C, D, A, B, E, A, B, C, D, E. If the page replacement algorithm is FIFO, the number of page transfers with an empty internal store of 3 frames is :				C3	
	a. 8	b. 10	c. 9	d. 7		(1)
17.	Optimal page – replacement algorithm is :				C3	
	a. Replace the page that has not been used for a long time	b. Replace the page that has been used for a long time	c. Replace the page that will not be used for a long time	d. None of these		(1)
18.	Total memory space exists to satisfy a request, but it is not contiguous. It is known as _____.				C1	
	a. External fragmentation	b. Internal Fragmentation	c. Aging	d. Compaction		(1)
19.	The two memory access problem in paging can be solved by the use of a special hardware cache called _____.				C1	
	a. Page table	b. Translation look aside buffer	c. Segmentation table	d. Memory table		(1)
20.	The algorithm in which we allocate memory to each process according to its size is known as				C1	
	a. proportional allocation algorithm	b. equal allocation algorithm	c. split allocation algorithm	d. None of the mentioned		(1)

21.	_____ is a program that acts as an intermediary between a user of a computer and the computer hardware.				C1	
	a. Application Program	b. Operating System	c. Software	d. RAM		(1)
22.	To access the services of operating system, the interface is provided by the				C1	
	a. System calls	b. API	c. Library	d. Assembly Instructions		(1)
23.	A _____ is a software-generated interrupt caused either by an error or a user request.				C1	
	a. Bootstrap Program	b. Service Routine	c. Trap	d. Register		(1)
24.	Which one of the following error will be handled by the operating system?				C1	
	a. Power failure	b. Printer out of paper	c. Connection failure in the network	d. all of the mentioned		(1)
25.	The ability to continue providing service proportional to the level of surviving hardware is called _____				C1	
	a. Graceful degradation	b. Fault tolerance	c. Throughput	d. Multitasking		(1)
26.	The state of a process is defined by :				C1	
	a. the final activity of the process	b. the activity just executed by the process	c. the activity to be next executed by the process	d. the current activity of the process		(1)
27.	_____ is a mechanism for controlling the access of processes or users to resources defined by the OS.				C1	
	a. Security	b. Protection	c. Defense	d. Caching		(1)
28.	Which of the following is not a state of a process?				C1	
	a. New	b. Waiting	c. Old	d. Running		(1)
29.	A _____ system has well defined, fixed time constraints and the processing must be done within the defined constraints or the system will fail.				C1	
	a. Real time	b. Distributed	c. Clustered	d. Embedded		(1)
30.	The occurrence of an event is usually signaled by				C1	
	a. Controller	b. Device driver	c. Interrupt	d. Firmware		(1)
31.	_____ system call creates new process in linux.				C1	
	a. create process()	b. create()	c. open()	d. fork()		(1)
32.	A minimum of _____ variable(s) is/are required to be shared between processes to solve the critical section problem.				C1	
	a. One	b. Two	c. Three	d. Four		(1)
33.	A problem encountered in multitasking when a process is perpetually denied necessary resources is called _____.				C2	
	a. Preemption	b. Inversion	c. Deadlock	d. Starvation		(1)
34.	Which module gives control of the CPU to the process selected by the short-term scheduler?				C2	
	a. Dispatcher	b. Interrupt	c. Scheduler	d. None of the Mentioned		(1)
35.	The signal operation of the semaphore basically works on the basic _____ system call.				C1	
	a. start()	b. sleep()	c. wakeup()	d. continue()		(1)
36.	The interval from the time of submission of a process to the time of completion is called _____.				C2	
	a. Waiting time	b. Throughput	c. Dispatch	d. Turnaround time		(1)

37.	In priority scheduling algorithm, when a process arrives at the ready queue, its priority is compared with the priority of _____.				C2	
	a. Init Process	b. Currently Running Process	c. All Processes	d. Child Process		(1)
38.	The address of the next instruction to be executed by the current process is provided by the				C1	
	a. CPU Registers	b. Program Counter	c. Process Stack	d. Pipe		(1)
39.	Suppose that a process is in “Blocked” state waiting for some I/O service. When the service is completed, it goes to the _____.				C1	
	a. New State	b. Running State	c. Ready State	d. Terminated State		(1)
40.	_____ process spends more time doing computations; few very long CPU bursts.				C2	
	a. CPU Bound	b. I/O Bound	c. Memory Bound	d. Independent		(1)

**PART B(8 X 5 = 40 MARKS) (ANSWER ANY EIGHT)**

41.	Investigate the necessity for process synchronization. Illustrate a software based peterson’s solution to the critical section problem.	C2	(5)
42.	Define virtual file system.	C1	(5)
43.	Examine the issues to be considered in designing multithreaded programs	C2	(5)
44.	As a process executes it changes state. Discuss the different states of a process and explain about process control block.	C2	(5)
45.	Write a short note on the common techniques for structuring the page table.	C1	(5)
46.	Illustrate the significance of resource allocation graph.	C1	(5)
47.	What is thrashing? How do you prevent it?	C2	(5)
48.	Explore the details of a modern computer system and illustrate storage and I/O structure.	C1	(5)
49.	Explain any two directory implementation methods for file system.	C1	(5)
50.	Define disk scheduling algorithm.	C1	(5)

**PART C( 2 X 10 = 20 MARKS) (ANSWER ANY TWO)**

51.	<p>Consider the following set of processes, with the length of the CPU burst and Arrival time given in milliseconds:</p> <table><tr><td>Process</td><td>Burst Time</td><td>Arrival Time</td></tr><tr><td>P1</td><td>10</td><td>0</td></tr><tr><td>P2</td><td>6</td><td>1</td></tr><tr><td>P3</td><td>12</td><td>2</td></tr><tr><td>P4</td><td>15</td><td>3</td></tr></table> <p>i) Draw Gantt charts that illustrate the execution of these processes using the following scheduling algorithms: FCFS, preemptive &amp; Non preemptive versions of SJF and Round Robin (time quantum =3)</p> <p>ii) Compute average turn around and waiting time.</p>	Process	Burst Time	Arrival Time	P1	10	0	P2	6	1	P3	12	2	P4	15	3	C3	(10)
Process	Burst Time	Arrival Time																
P1	10	0																
P2	6	1																
P3	12	2																
P4	15	3																
52.	<p>Consider the following page reference string:</p> <p>7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1</p> <p>How many page faults would occur for the following replacement algorithms: LRU, FIFO, and Optimal assuming three frames that all frames are initially empty?</p>	C3	(10)															

53.	Consider the following requests are in the disk queue: 98, 183, 37,122, 14, 124, 65, 67 Explain the procedure to provide services for above request sequence with the help of FCFS and SSTF disk scheduling algorithms. ( with proper block diagrams)	C1	(10)
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ALL THE BEST

\*-unnecessary/extra rows can be deleted

\*-course outcome (CO1,CO2...)should be included

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