University of Mumbai

Examination June 2021

Examinations Commencing from 1st June 2021

Program: **Information Technology**

Curriculum Scheme: Rev 2019

Examination: BE Semester IV

Course Code: ITC 403 and Course Name: Operating System

Time: 2-hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	What is operating system?
Option A:	Collection of programs that manages hardware resources
Option B:	System service provider to the application programs
Option C:	Interface between user and hardware
Option D:	Collection of programs that manages Software resources
2.	Which of the following is not the Network Operating system ?
Option A:	Ubuntu
Option B:	Windows 7
Option C:	Unix
Option D:	Mach
3.	--- provides the interface to access the services of operating system.
Option A:	System calls
Option B:	API
Option C:	Library
Option D:	Command interpreter
4.	The process enters from ------- state to ------ when interrupt occurs.
Option A:	Ready, Running
Option B:	Running, Waiting
Option C:	Running, Ready
Option D:	Waiting, Running
5.	Which of the statement is correct from the following statements? I. The long-term scheduler selects the process form the job pool and loads into the main memory II. The short-term scheduler selects the process from waiting queue and allocates to the processor for execution III. The execution frequency of short-term scheduler is more than long term scheduler IV. The medium-term scheduler executes less frequently than long term scheduler
Option A:	I and II
Option B:	II and III
Option C:	III and IV
Option D:	I and III

6.	In RR scheduling algorithm if the time quantum is increased more, then it acts as a ----- algorithm
Option A:	FCFS
Option B:	SJF
Option C:	Multilevel Queue
Option D:	Priority
7.	In which of the load balancing the specific task find for imbalance on each processor, if found then moves processes form one overloaded processor to Idle one.
Option A:	Pull Migration
Option B:	Push Migration
Option C:	Mutually exclusive Pull and Push Migration
Option D:	Hyper threading Algorithm
8.	The productive operating system, checks for the deadlock --------
Option A:	Every time the process requests recourse
Option B:	After a specific time interval
Option C:	When a system is in unsafe state
Option D:	Every time a resource request is made at a fixed time interval
9.	In a certain application a value of counting semaphore is 17. The following operations were completed on the semaphores in the given order 2P, 20P, 5V, 10V, 10P, 2P. What would be the new value of counting semaphore?
Option A:	2
Option B:	10
Option C:	0
Option D:	3
10.	Which of the statements are true in case of recovery from Deadlock ? I Ignore the processes which are in deadlock state II Abort all resources which are in deadlock III Abort one process at a time until deadlock cycle is eliminated IV Abort the process which requests the deadlocked resources
Option A:	Only III
Option B:	Only IV
Option C:	II and III
Option D:	Only IV
11.	In dynamic storage allocation problem, the --- fit and --- fit are preferable than ---- fit.
Option A:	Worst, First, Best
Option B:	Best, First, Worst
Option C:	Worst, Best, First
Option D:	Worst, First, Best
12.	Which of the sentence is false? I Valid bit indicates that the page is in process's logical address space II Valid and Invalid bits provides protection. III Invalid bit indicates that the page is not in process's logical address space IV Shared pages do not have the Valid, Invalid bits

Option A:	IV
Option B:	III
Option C:	I and II
Option D:	I and III
13.	Generally, each process has an associated ------
Option A:	Segment Table
Option B:	Page Table
Option C:	Cache
Option D:	Virtual Memory
14.	Which of the following are the likely causes of thrashing? I. There are too many applications in the system II. The segment size was very small III. First in first out policy is followed IV. Least recently used policy for page replacement is used
Option A:	II and IV
Option B:	I and III
Option C:	II and III
Option D:	I and IV
15.	After an allocation of space using the worst-fit policy the number of holes in memory --- .
Option A:	Increases by one
Option B:	Decreases by one
Option C:	Remains same
Option D:	Memory Reduces by the process size
16.	If there are 32 segments, each of size 1KB ,then the logical address should have ----
Option A:	13 bit
Option B:	14 bit
Option C:	15 bit
Option D:	16 bit
17.	----- causes file system fragmentation.
Option A:	Unused space or single file are not contiguous
Option B:	Used space is not contiguous
Option C:	Used space is non-contiguous
Option D:	Multiple files are non-contiguous
18.	Which of the statement is true
Option A:	RAID level 0 supports byte stripping
Option B:	RAID level 1 allows bit stripping
Option C:	RAID level 0 supports no mirroring and RAID 1 supports mirroring with block striping
Option D:	RAID protects against data protection.
19.	The number of applications in any given task at a particular time in Android are ----
Option A:	One
Option B:	Many
Option C:	Few

Option D:	Zero
20.	Which of the following which is not the characteristics of embedded system
Option A:	Real time operation
Option B:	Reactive Operation
Option C:	Continuity
Option D:	I/O device flexibility

<table>
<tr><td>Q2</td><td>Solve any Two Questions out of Three 10 marks each</td></tr>
<tr><td>A</td><td>Consider following processes. Calculate the Waiting and Turnaround time for each process using SJF and RR algorithm. Time quantum is 3.
<table>
<tr><td>Process Id</td><td>Burst Time</td><td>Arrival Time</td></tr>
<tr><td>P1</td><td>8</td><td>0</td></tr>
<tr><td>P2</td><td>4</td><td>1</td></tr>
<tr><td>P3</td><td>9</td><td>2</td></tr>
<tr><td>P4</td><td>5</td><td>3</td></tr>
</table></td></tr>
<tr><td>B</td><td>What is a thread? How multithreading is beneficial? Compare and contrast different multithreading models.</td></tr>
<tr><td>C</td><td>What is semaphore and its types? How the classic synchronization problem -Dining philosopher is solved using semaphores?</td></tr>
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<tr><td>Q3</td><td>Solve any Two Questions out of Three 10 marks each</td></tr>
<tr><td>A</td><td>Consider the page reference string 1,2,3,5,2,4,5,6,2,1,2,3,7,6,3,2,1,2,3,6. Calculate the Page fault using 1. Optimal 2. LRU 3. FIFO algorithms for a memory with three frames.</td></tr>
<tr><td>B</td><td>Consider the snapshot of a system. Answer the following questions based on Bankers Algorithm
<table>
<tr><td></td><td>Allocation</td><td>Max</td><td>Available</td></tr>
<tr><td></td><td>ABCD</td><td>ABCD</td><td>ABCD</td></tr>
<tr><td>P0</td><td>0012</td><td>0012</td><td>1520</td></tr>
<tr><td>P1</td><td>1000</td><td>1750</td><td></td></tr>
<tr><td>P2</td><td>1354</td><td>2356</td><td></td></tr>
<tr><td>P3</td><td>0632</td><td>0652</td><td></td></tr>
<tr><td>P4</td><td>0014</td><td>0656</td><td></td></tr>
</table>
i. What is the content of Need Matrix?
ii. Is the system is safe state? What is the safe sequence?</td></tr>
<tr><td>C</td><td>What is open-source operating system? What are the design issues of Mobile operating system and Real time operating system?</td></tr>
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