### MAKE-UP EXAMINATIONS (2022) QUESTION PAPER - PART A

COURSE CODE	: CSE3153
COURSE NAME	: OPERATING SYSTEMS
SEMESTER	: V
DATE OF EXAM	: 26 /02 /2022
DURATION	: 45 + 5 minutes

#### Instructions for Students:

(1) ANSWER ALL THE QUESTIONS.
(2) EACH QUESTION CARRIES 1 MARK.
(3) YOU ARE INSTRUCTED TO INFORM THE INVIGILATOR AFTER SUBMISSION OF THIS FORM IN THE CHAT SECTION.

#### 1. User interaction with the computer system is possible in \_\_\_\_\_\_

multi-programming

#### multi-tasking

Both multi-programming and multi-tasking

none of these

2. \_\_\_\_\_ chooses a job if there are several jobs waiting to be executed at the same time in the main memory

#### **CPU scheduling**

job scheduling

swapping

context switch

3. The Intel 64 family of CPUs supports\_\_\_\_\_ privilege levels

One

two

three

<mark>four</mark>

4. Timer is used to \_\_\_\_\_

control the operating system operations

to connect to the Internet

### to control the user program execution on hardware

to control the kernel mode executions

5. \_\_\_\_\_ is the fastest storage in computer system

main memory

cache

register

magnetic disk

6. Choose the INCORRECT operating system operation from the following

### recovery from failure

file-system manipulation

communications

error detection

7. \_\_\_\_\_ are the one who manage the computer

power user

system administrator

programmer

developer

8. Dirty bit of a page in a page table

- a. Allows only read on a page
- b. Helps to maintain LRU information
- c. Helps to avoid unnecessary writes on paging device
- d. Helps to avoid thrashing
- 9. Which of the following statement is false in case of virtual memory?
  - a. It helps to translate logical address to physical address
  - b. It allows program larger than main memory
  - c. Increases degree of multiprogramming
  - d. Reduces context-switch overhead
- 10. A system with byte-addressable memory, 32-bit logical addresses, 4KB page size and page table entries of 4 bytes each. The size of the page table in the system in MB is
  - a. 2MB
  - <mark>b. 4MB</mark>
  - c. 6MB
  - d. 8MB
- 11. A 1000 KB memory is managed using variable partitions allocation. It currently has two partitions of sizes 200KB and 260KB respectively. The smallest allocation request in KB that could be denied is for
  - <mark>a. 541</mark>
  - b. 150
  - c. 179
  - d. 230
- 12. LOOK scheduling is an extension of
  - a. SSTF
  - <mark>b. SCAN</mark>
  - c. FCFS
  - d. Its Own
- 13. A paging scheme uses a TLB. A TLB access takes 20ns and main memory access takes 60ns. What is the effective access time (in ns) if the TLB hit ratio is 90%?
  - a. 90
  - b. 50
  - <mark>c. 100</mark>
  - d. 80
- 14. Limit and base registers of a segment include 400 and 4300 respectively. The reference to a byte 530 of this segment is
  - a. Legal reference
  - b. Illegal reference
  - c. Both legal and illegal
  - d. Neither legal nor illegal
- 15. Which of the page replacement algorithm requires future knowledge of the string?
  - <mark>a. Optimal</mark>
  - b. FIFO
  - c. LRU
  - d. None of the above

16. Which of the following statements are true for the FCFS Scheduling algorithm?

i)FCFS uses FIFO queue for ordering ii) FCFS uses STACK structure for ordering iii) Process average waiting time is quite long iv) Optimal scheduling algorithm.

A) i, ii, iv
B) iii, iv
C) i, iii
D) i, ii, iii, iv

17. The multilevel feedback queue scheduler is defined by the following parameters.

i) The method used to determine when to block the process.

ii)The method used to determine when to demote a process to a lower-priority queue

iii)The method used to determine which queue a process will enter when that process needs service.

iv) The method used to determine when to terminate the process.

A)i, iv

### B) <mark>ii, iii</mark>

C) i, ii, iii, iv

D) i, ii, iii

**18.** Choose the right option for wait for graph.

i)used when single instance of the resource.

ii)used when multiple instances of resources.

iii) used to detect cycle in a graph.

iv)used to avoid deadlock in operating systems.

A) **ii, iii** B) i, ii C) iii, iv D) ii, iii, iv

**19.** A preemptive kernel is not used in\_\_\_\_\_.

i)Real time processes

ii) Distributed processes

iii) cooperating process

# iv) Windows Operating systems

**20**. consider a system consisting of two processes, P0 and P1, each accessing two semaphores, S and Q, set to the value 1:

	PO	P1	
	<pre>wait(S);</pre>	wait(Q);	
	wait(Q);	<pre>wait(S);</pre>	
		•••	
	signal(S);	signal(Q);	
	signal(Q);	<pre>signal(S);</pre>	
After the execution of th	ese statements	system will be in_	

A) deadlock state

# B) deadlock state depends on the order of execution

C) never enter into deadlock

D) deadlock free state

21 An edge from process P<sub>2</sub> to P<sub>1</sub> in a wait for graph indicates that \_\_\_\_\_

A)  $P_1$  is waiting for  $P_2$  to release a resource that  $P_2$  needs

b) P2 is waiting for P1 to release a resource that P2 needs

c)  $P_1$  is waiting for  $P_2$  to leave the system

d)  $P_2$  is waiting for  $P_1$  to leave the system

22. A computer system has 12 tape drives, with 'n' processes competing for them. Each process may need 4 tape drives. The maximum value of 'n' for which the system is guaranteed to be deadlock free is?

A. 3

**B.** 4

C. 5

D. 2

23. Consider the following set of processes, arriving at the given times and having the following CPU burst time and priorities (Smaller number is having higher priority):

Process	Arrival	Burst Time	Priority		
	Time(ms)	(ms)			
А	0	8	3		
В	3	4	1		
С	5	7	4		
D	8	3	2		

What is the turnaround time of **process C** using **Round Robin** scheduling algorithms (quantum time 3 ms).

- A. 15
- B. 13
- C. 17
- D. 11

24. \_\_\_\_\_ information is stored on the per-process table so the OS can allow or deny subsequent I/O requests.

a)user

b)BIOS

c)IPC

d)access rights

# 25 virtual Memory implemented through

- a) Paging
- b) Demand paging
- c) Segmentation
- d) Thrashing

26. "invalid bit" in a page table of demand paging indicates

- a) Page is not legal
- b) frame is illegal
- c) page is in physical memory not in disk

# d)frame is in smaller than page

27 The lowest cylinder movements in \_\_\_\_\_ disk scheduling algorithm

- a) FCFS
- b) SCAN

c) LOOK

d) SSTF

28. In which implementation method of Access Matrix uses ordered triplets < domain, oject, right-sets>

a) Access list for ojejcts

# b) Global Table

c) Capaility List for domains

d) Lock-key mechanism

29. \_\_\_\_\_ begins at the root and follows a path down to the sspecified file, giving the directory names on the path.

a) class path

# b) absolute path

- c) Name
- d) home

30. Thhe location within the file structure where the file system is to e attached is called

a)restore point

# b)mount point

c)root

d)directpath

Reg. No.					
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# **V SEMESTER B.TECH. (COMPUTER SCIENCE AND ENGINEERING) MAKE-UP EXAMINATIONS 2022** SUBJECT: OPERATING SYSTEMS [CSE 3153] **REVISED CREDIT SYSTEM**

(26/02/2022)

Time: 9:20am-10:35 am

MAX. MARKS: 20

# Instructions to Candidates:

- ✤ Answer ALL the questions.
- ✤ Missing data may be suitably assumed.
- 1A. With a neat diagram, illustrate how operating system distinguishes between the execution of **5M** operating-system code and user-defined code? **1B**. Suppose that a disk drive has 200 cylinders, numbered from 0 to 199. The drive is currently **3M** serving a request at cylinder 60 and the queue of pending requests is: 85, 158, 38, 138, 34, 70, 64, and 13. Starting from current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all pending requests for each of the following disk-scheduling algorithms? a) FCFS b) SSTF c) LOOK **2M**

1C. Illustrate the two-level directory structure with a neat figure

2A. The following processes are being scheduled using a FCFS, non-preemptive SJF, and Round-5M Robin (Time quantum- 3ms) scheduling algorithms.

Processes	Arrival Time	Burst Time
P1	2	4
P2	1	7
P3	4	3
P4	0	5
P5	3	2

- a) Show the scheduling order of the processes using a Gantt chart.
- b) What is the turnaround time for each process?
- c) What is the response time for each process?

d) What is the waiting time for each process?

2B. A system has 12 resources of A type, 14 resources of B type and 15 resources of C type. Apply3M Banker's algorithm and check whether the system is safe using Bankers algorithm

Processes	MAX			Allocation			Available		
	А	В	С	А	В	С	А	В	С
P1	8	7	5	2	3	4	?	?	?
P2	7	4	4	4	2	3			
P3	2	5	5	1	4	4			
P4	5	5	5	5	5	4			

2C. There are 5 resources R1 with 2 instances, R2 with single instance, R3 with 2 instances, R4 with single instance and R5 with single instance

Process P1 holding one instance of R1 and an instance of R2 and requesting one instance of R5

Process P2 holding one instance of R1 and an instance of R4.

Process P3 is holding one instance of R3 and requesting one instance of R2.

Process P4 is holding one instance of R3 and requesting for one instance of R4 and requesting one instance of resource R5

Process P5 is requesting for one instance of R3 and holding one instance of R5. Process P6 is requesting for one instance of R4.

Draw the resource allocation graph and identify whether deadlock exists? If yes, how many processes are involved in the deadlock? If No, give reason.Justify your answer depending on Yes/No.

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