Name: ..... Group ……

Operating System Fundamentals Exam Answer Sheet
Time: 90 minutes

(Mark ONE answer only!) Ex. A ☐ B ☒ C ☐ D ☐

1.	A ☐	B ☐	C ☐	D ☐		31.	A ☐	B ☐	C ☐	D ☐
2.	A ☐	B ☐	C ☐	D ☐		32.	A ☐	B ☐	C ☐	D ☐
3.	A ☐	B ☐	C ☐	D ☐		33.	A ☐	B ☐	C ☐	D ☐
4.	A ☐	B ☐	C ☐	D ☐		34.	A ☐	B ☐	C ☐	D ☐
5.	A ☐	B ☐	C ☐	D ☐		35.	A ☐	B ☐	C ☐	D ☐
6.	A ☐	B ☐	C ☐	D ☐		36.	A ☐	B ☐	C ☐	D ☐
7.	A ☐	B ☐	C ☐	D ☐		37.	A ☐	B ☐	C ☐	D ☐
8.	A ☐	B ☐	C ☐	D ☐		38.	A ☐	B ☐	C ☐	D ☐
9.	A ☐	B ☐	C ☐	D ☐		39.	A ☐	B ☐	C ☐	D ☐
10.	A ☐	B ☐	C ☐	D ☐		40.	A ☐	B ☐	C ☐	D ☐
11.	A ☐	B ☐	C ☐	D ☐		41.	A ☐	B ☐	C ☐	D ☐
12.	A ☐	B ☐	C ☐	D ☐		42.	A ☐	B ☐	C ☐	D ☐
13.	A ☐	B ☐	C ☐	D ☐		43.	A ☐	B ☐	C ☐	D ☐
14.	A ☐	B ☐	C ☐	D ☐		44.	A ☐	B ☐	C ☐	D ☐
15.	A ☐	B ☐	C ☐	D ☐		45.	A ☐	B ☐	C ☐	D ☐
16.	A ☐	B ☐	C ☐	D ☐		46.	A ☐	B ☐	C ☐	D ☐
17.	A ☐	B ☐	C ☐	D ☐		47.	A ☐	B ☐	C ☐	D ☐
18.	A ☐	B ☐	C ☐	D ☐		48.	A ☐	B ☐	C ☐	D ☐
19.	A ☐	B ☐	C ☐	D ☐		49.	A ☐	B ☐	C ☐	D ☐
20.	A ☐	B ☐	C ☐	D ☐		50.	A ☐	B ☐	C ☐	D ☐
21.	A ☐	B ☐	C ☐	D ☐		51.	A ☐	B ☐	C ☐	D ☐
22.	A ☐	B ☐	C ☐	D ☐		52.	A ☐	B ☐	C ☐	D ☐
23.	A ☐	B ☐	C ☐	D ☐		53.	A ☐	B ☐	C ☐	D ☐
24.	A ☐	B ☐	C ☐	D ☐		54.	A ☐	B ☐	C ☐	D ☐
25.	A ☐	B ☐	C ☐	D ☐		55.	A ☐	B ☐	C ☐	D ☐
26.	A ☐	B ☐	C ☐	D ☐						
27.	A ☐	B ☐	C ☐	D ☐						
28.	A ☐	B ☐	C ☐	D ☐						
29.	A ☐	B ☐	C ☐	D ☐						
30.	A ☐	B ☐	C ☐	D ☐						

Q. 1 Choose the Best Answer [1.5 points each]

1) Information about a process is maintained in a _____.
a) Stack
b) Translation Lookaside Buffer
c) Process Control Block
d) Program Control Block

2) Identify the odd thing in the services of operating system.
a) Accounting
b) Protection
c) Error detection and correction
d) Dead lock handling

3) In _____ OS, the response time is very critical.
a) Multitasking
b) Batch
c) Online
d) Real-time

4) Real time systems are _____.
a) Primarily used on mainframe computers
b) Used for monitoring events as they occur
c) Used for program development
d) Used for real time interactive users

5) When Interrupt occurs, control is immediately transferred to _____
a) Interrupt Vector
b) Interrupt Request
c) Interrupt Handler
d) All of the above

6) Services Provided by the Operating System:
a) Collect statistics
b) Error detection
c) Grant request
d) All of the above

7) Inter process communication can be done through _____.
a) Mails
b) Messages
c) System calls
d) Traps

8) In Priority Scheduling a priority number (integer) is associated with each process. The CPU is allocated to the process with the highest priority (smallest integer = highest priority). The problem of, Starvation ? low priority processes may never execute, is resolved by _____.
a) Terminating the process.
b) Aging
c) Mutual Exclusion
d) Semaphore

9) CPU performance is measured through _____.
a) Throughput
b) MHz
c) Flaps
d) None of the above

10) Which of the following is contained in Process Control Block (PCB)?
a) Process Number
b) List of Open files
c) Memory Limits
d) All of the Above

11) Software is a program that directs the overall operation of the computer, facilitates its use and interacts with the user. What are the different types of this software ?
a) Operating system
b) System software
c) Utilities
d) All of the above

12) A _____ is a software that manages the time of a microprocessor to ensure that all time critical events are processed as efficiently as possible. This software allows the system activities to be divided into multiple independent elements called tasks.

a) Kernel
b) Shell
c) Processor
d) Device Driver

13) The primary job of the operating system of a computer is to _____.

a) Command Resources
b) Manage Resources
c) Provide Utilities
d) Be user friendly

14) With the round robin CPU scheduling in a time-shared system _____.

a) Using very large time slice degenerates in to first come first served algorithm
b) Using extremely small time slices improve performance
c) Using extremely small time slices degenerate in to last in first out algorithm
d) Using medium sized time slices leads to shortest request time first algorithm

15) Which of the following is a criterion to evaluate a scheduling algorithm?

a) CPU Utilization: Keep CPU utilization as high as possible.
b) Throughput: number of processes completed per unit time.
c) Waiting Time: Amount of time spent ready to run but not running.
d) All of the above

16) Super computers typically employ _____.

a) Real time Operating system
b) Multiprocessors OS
c) Desktop OS
d) None of the above

17) What is a shell?

a) It is a hardware component
b) It is a command interpreter
c) It is a part in compiler
d) It is a tool in CPU scheduling

18) The operating system manages _____.

a) Memory
b) Processor
c) Disk and I/O devices
d) All of the above

19) The Hardware mechanism that enables a device to notify the CPU is called _____.

a) Polling
b) Interrupt
c) System Call
d) None of the above

20) Process State is stored in _____.

a) Process Control block
b) Inode
c) File Allocation Table
d) None of the above

21) A binary semaphore

a) has the values one or zero
b) is essential to binary computers
c) is used only for synchronization
d) is used only for mutual exclusion

22) A program at the time of executing is called _____.

a) Dynamic program
b) Static program
c) Binded Program
d) A Process

23) _____ OS pays more attention on the meeting of the time limits.

a) Distributed
b) Network
c) Real time
d) Online

24) A process said to be in _____ state if it was waiting for an event that will never occur.
a) Safe
b) Unsafe
c) Starvation
d) Dead lock

25) A thread is a _____ process .
a) Heavy Weight
b) Mutliprocess
c) Inter Thread
d) Light weight

26) A major problem with priority scheduling is _____.
a) Definite blocking
b) Starvation
c) Low priority
d) None of the above

27) It is not the layer of the Operating system.
a) Kernel
b) Shell
c) Application program
d) Critical Section

28) _____ provide the interface between a running program and the operating system.
a) Editors
b) Compilers
c) System Call
d) System Programs

29) Mutual exclusion
a) if one process is in a critical region others are excluded
b) prevents deadlock
c) requires semaphores to implement
d) is found only in the Windows NT operating system

30) Which scheduler controls the degree of multiprogramming?
a) Short term scheduler
b) Long term scheduler
c) Middle term scheduler
d) None of the above

31) The state of a process after it encounters an I/O instruction is _____.
a) Ready
b) Blocked/Waiting
c) Idle
d) Running

32) In one of the deadlock prevention methods, impose a total ordering of all resource types, and require that each process requests resources in an increasing order of enumeration. This violates the _____ condition of deadlock
a) Mutual exclusion
b) Hold and Wait
c) Circular Wait
d) No Preemption

33) A scheduling algorithm is fair
a) if no process faces starvation
b) if a process is starved, detect it and run it with high priority
c) if it uses semaphores
d) only if a queue is used for scheduling

34) Semaphore can be used for solving _____.
a) Wait & signal
b) Deadlock
c) Synchronization
d) Priority

35)Round robin scheduling is essentially the preemptive version of _____.
a) FIFO
b) Shortest job first
c) Shortest remaining
d) Longest time first

36) Maximize throughput, minimize response time, and accommodate as many users as possible is considered as:

a) Fairness
b) Efficiency
c) Differential responsiveness
d) All of the above

37) Let S and Q be two semaphores initialized to 1, where P0 and P1 processes the following statements wait(S);wait(Q); ---; signal(S);signal(Q) and wait(Q); wait(S);---;signal(Q);signal(S); respectively. The above situation depicts a _____ .

a) Semaphore
b) Deadlock
c) Signal
d) Interrupt

38) Which is not the state of the process ?

a) Blocked
b) Running
c) Ready
d) Privileged

39) The solution to Critical Section Problem is : Mutual Exclusion, Progress and Bounded Waiting.

a) The statement is false
b) The statement is true.
c) The statement is contradictory.
d) None of the above

40) The number of processes completed per unit time is known as _____.

a) Output
b) Throughput
c) Efficiency
d) Capacity

41) Which technique was introduced because a single job could not keep both the CPU and the I/O devices busy?

a) Time-sharing
b) SPOOLing
c) Preemptive scheduling
d) Multiprogramming

42) FIFO scheduling is _____.

a) Preemptive Scheduling
b) Non Preemptive Scheduling
c) Deadline Scheduling
d) Fair share scheduling

43) Switching the CPU to another Process requires to save state of the old process and loading new process state is called as _____.

a) Process Blocking
b) Context Switch
c) Time Sharing
d) None of the above

44) The Banker's algorithm is used

a) to prevent deadlock in operating systems
b) to detect deadlock in operating systems
c) to rectify a deadlocked state
d) none of the above

45) _____ is a high level abstraction over Semaphore.

a) Shared memory
b) Message passing
c) Monitor
d) Mutual exclusion

46) The kernel of the operating system remains in the primary memory because _____.

a) It is mostly called (used)
b) It manages all interrupt calls
c) It controls all operations in process
d) It is low level

47) The technique, for sharing the time of a computer among several jobs, which switches jobs so rapidly such that each job appears to have the computer to itself, is called _____.

a) Time Sharing
b) Time out
c) Time domain
d) Multitasking

48)An operating system is _____ driven.

a) Trap.
b) an instruction .
c) an interrupt.
d) none of the above.

49)In Simple Batch System, programs are submitted in _____

a) groups.
b) batches.
c) queues.
d) all of the above.

50) _____ access is used to transfer blocks of data from buffer storage directly to main memory without CPU intervention.

a) Main memory access
b) cache memory access
c) Direct memory access
d) virtual memory access

Q. 2 Choose the Correct Answer [3 points each] – (verify your choice)

51) Using Shortest Remaining Time First algorithm, find the average waiting time for the following set of processes given with their arrival time in the order:

Process	: Burst Time	: Arrival time .
P1	: 10	: 0 ,
P2	: 1	: 1 ,
P3	: 2	: 4 ,
P4	: 1	: 5 ,
P5	: 5	: 12.

a) 1.4 milliseconds preemptive
b) 2.4 milliseconds
c) 5 milliseconds non-preemptive
d) 5.2 milliseconds

Verification of the choice:

52) Using Round Robin Scheduling algorithm with quantum time slice = 4 , find the average waiting time for the following set of processes given with their arrival time in the order:

Process	**: Burst Time**	**: Arrival time .**
P1	**: 10**	**: 0 ,**
P2	**: 1**	**: 1 ,**
P3	**: 2**	**: 4 ,**
P4	**: 1**	**: 5 ,**
P5	**: 5**	**: 12.**

a) 1.4 milliseconds
b) 2.4 milliseconds
c) 5 milliseconds
d) 5.2 milliseconds

Verification of the choice:

53) Using First Come First Served Scheduling algorithm, find the average waiting time for the following set of processes given with their arrival time in the order:

Process	**: Burst Time**	**: Arrival time .**
P1	**: 10**	**: 0 ,**
P2	**: 1**	**: 1 ,**
P3	**: 2**	**: 4 ,**
P4	**: 1**	**: 5 ,**
P5	**: 5**	**: 12.**

a) 1.4 milliseconds
b) 2.4 milliseconds
c) 5 milliseconds
d) 5.2 milliseconds

Verification of the choice:

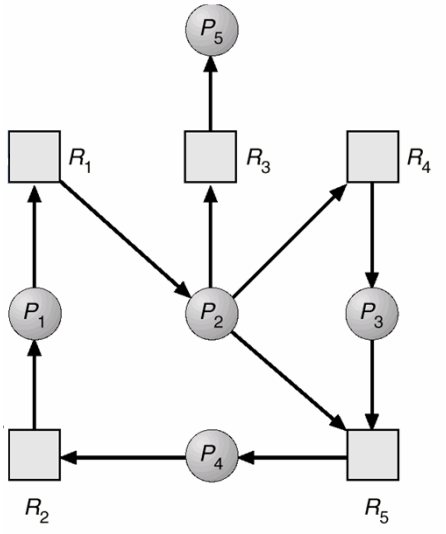
54) Using Shortest Job First Scheduling algorithm, find the average waiting time for the following set of processes given with their arrival time in the order:

Process	: Burst Time	: Arrival time .
P1	: 10	: 0 ,
P2	: 1	: 1 ,
P3	: 2	: 4 ,
P4	: 1	: 5 ,
P5	: 5	: 12.

a) 1.4 milliseconds
b) 2.4 milliseconds
c) 5 milliseconds
d) 5.2 milliseconds

Verification of the choice:

55) The following resources allocation graph shows a deadlock. What is the best process should be killed to solve the deadlock?



a) P1
b) P2
c) P3
d) P4

Verification of the choice: