Q.1 Fill in the blanks:

1. Single system image is obtained in case of _____
Multiprocessor Operating System or Cluster Operating System

2. Turnaround Time refers to _____.
The time measured when a process enters a system and completes its execution, i.e. the time when a process is created and when it is terminated. For example, if a process is created at time t1, and it completes its execution at time t9, then the turnaround time is t9 – t1.
(u can also refer to chapter 3 for the exact definition).

3. _____ scheduler selects the process that is ready to execute to CPU.
Short term scheduler (also known as CPU scheduler)

4. Banker's algorithm is an example of _____ avoidance.
Deadlock avoidance.

5. _____ is an example of Distributed operating system.
There are many examples here: linux, solaris, AIX, HP-UX, windows, IRIX, etc.
(you can also check chapter 1).

6. _____ is an example of timesharing scheduling policy.
Round robin.

7. _____is an example of shareable resource and _____ is an example for non shareable resource.
Read-only file is a example of shareable resource and printer is an example for non-shareable resource.

8. _____ and _____ are the popular page replacement algorithms.
FIFO and LRU.
Optimal page replacement policy is never used in practice.

9. _____ is to NT , where as _____ is to DOS and _____ is to UNIX.
Ambiguous question ☺

10. Give the expansion of the following with reference to the operating systems concepts: FCB is _____IOCS is _____
FCB is File Control Block
IOCS ➔ ?
It could be "Input Output Control System", but I am not very sure. You can check the index page (towards the end) of Galvin.

11. Throughput in case of multiprogramming is_____.
High.

12. _____is process of modifying the addresses used in the address sensitive instructions of a program such that the program can execute correctly from the designated area of memory.
The correct answer could be "binding" or "address translation"

13. A program is a _____ entity , whereas a process is a _____ entity.
Program is a passive entity, process is an active entity.

14. Mutex is a _____Semaphore.
Binary.

15. _____ is the coincidence of high paging traffic and low CPU utilization.
Thrashing.

16. FCFS stands for _____.
First Come First Serve.

17. The Scheduling policy in case of a batch processing system is _____.

FCFS.

18. Multiprogramming degenerates to _____ system if there is no proper mix of CPU and I/O bound jobs.
The correct answer could be “idle”, but this question is quite ambiguous. You could check chapter 1 of galvin.

19. DMA stands for _____
Direct Memory Access.

20. Protection of memory is ensured using _____ and _____.
Base (relocation) and limit registers.

21. _____ is forceful deallocation of a resource.
Preemption.

22. SPOOLING stands for _____
Simultaneous Peripheral Input Output.

23. A _____ operating system is an operating system which requires a timely response from a computer system.
Real-time.

24. _____ is a program in execution.
Process.

25. DOS is an example of _____ user system.
Single-user.

26. Unix is an example of _____ user system.
Multi-user.

27. Unix uses _____ scheduling policy .
Priority based time sharing. (at least Linux uses this policy).

28. _____ and _____ are the goals of an operating system.
Operating system goals:
Execute user programs and make solving user problems easier.
Make the computer system convenient to use.

29. _____ is a distributed operating system.
UNIX, HP-UX, Solaris, Linux, Windows.

30. The _____ determines which process is to be executed next.
Short term scheduler or CPU scheduler.

31. PSW stands for _____.
Process Status Word or Program Status Word. It is basically a **FLAG** register.

32. Mutex is an acronym for _____.
Mutual Exclusion.

33. A tape is a _____ device.
Sequential/Serial access device. It is also a tertiary device.

34. Single system image is obtained in case of _____
Multiprocessor Operating System or Cluster Operating System

35. Turnaround Time refers to _____.
The time measured when a process enters a system and completes its execution, i.e. the time when a process is created and when it is terminated. For example, if a process is created at time t1, and it completes its execution at time t9, then the turnaround time is t9 – t1.
(u can also refer to chapter 3 for the exact definition).

36. _____ scheduler selects the process that is ready to execute to CPU.
CPU Scheduler or short term scheduler.

37. Banker's algorithm is an example of _____ avoidance.
Deadlock.

38. _____ is an example of Distributed operating system.
Windows, Linux, Solaris, HP-UX, AIX, etc.

39. _____ is an example of timesharing scheduling policy.
Round robin.

40. _____is an example of shareable resource and _____ is an example for nonshareable resource.
Read-only file is a example of shareable resource and printer is an example for non-shareable resource.

41. _____ and _____ are the popular page replacement algorithms.
(refer above)

42. Unix is a _____, _____, and _____ operating system.
Multi-tasking, multi-user, and multi-programming. Also time-sharing.

43. Single system image is obtained in case of _____
(refer above)

44. Turn around Time refers to _____.
(refer above)

45. _____ scheduler selects the process that is ready to execute to CPU.
(refer above)

46. Banker's algorithm is an example of _____ avoidance.
(refer above)

47. _____ and _____ are the popular page replacement algorithms.
(refer above)

48. An OS is the interface between _____ & _____.
User and hardware OR user and resources.

49. A file is anything held on _____ storage.
Secondary or tertiary storage.

50. Compaction is done when you have _____ fragmentation.
External.

51. _____ is when more time is spent in paging than in actually running programs.
Thrashing.

52. A thread is a _____ process.
Light weight process.

53. The process of loading the OS into main memory is done by the _____.
Bootstrap loader.

54. The motivations behind networks are _____, _____, _____ & _____.
Sharing of data (files), sharing of resources (like network printer, etc.), communication, etc.

55. NRU stands for _____ and LRU stands for _____ .
LRU is least recently used. NRU could be Not Recently Used. I am not sure about NRU. You could check the index page of Galvin.

56. SPOOLING stands for _____
(refer above)

57. _____ is the coincidence of high paging traffic and low CPU utilization.
(refer above)

58. _____ is a path under execution.
Program.
(question is wrong).

59. The OS maintains information about each process in a record called _____ .
PCB (Process Control Block).

60. _____ is a relation between number of page faults and number of page frames allocated to a process.

61. _____ is the implementation method in case of MS-DOS for non-contiguous allocation.

62. _____ is a mechanism whereby the output of one process is directed into input of another process.
I/O redirection

63. The time elapsed for position of Read/Write head under the desired sector is called _____ .
Seek time.

64. _____ , _____ are the two ways to achieve relocation and address translation.
Paging and Segmentation.

65. The CPU utilization is low when the system is _____.
Thrashing or doing excessive I/O.

66. A space allocated in units of fixed size is called _____ .
Either it could be a **page** or it could be a **block**. It could also be a **sector**.

67. A modified page is also called as _____ page.
Dirty page, but I am not very sure. Please refer to galvin under (dirty bit : chapter related to Paging).

68. _____is an example of shareable resource and _____ is an example for non-shareable resource.
(refer above)

69. _____ is forceful deallocation of a resource.
(refer above)

70. Unix is an example of _____ user system.
Multi-user.

71. The _____ determines which process is to be executed next.
CPU scheduler or short-term scheduler.

72. FAT stands for _____ .
File Allocation Table.

Q.2 What do the following Abbreviations stand for? (1 mark each)

1. LWP LIGHT WEIGHT PROCESS
2. HRQ
3. DMA DIRECT MEMORY ACCESS
4. PCB PROCESS CONTROL BLOCK
5. FAT FILE ALLOCATION TABLE

Q.3 Multiple Answer Type Questions: (1 marks each)

1. Which of the following is a non-preemptive O.S.?
a) UNIX
b) Windows 95

c) Windows NT
d) None
correct answer is given under "preemptive and non preemptive kernels : handling 'critical section' in operating systems" chapter 7 of galvin)

2. The CPU utilization is low when the system is _____.
a) Timesharing
b) Thrashing
c) Multiprocessing
d) None of the above.
correct answer is thrashing.

3. The following iss not a form of IPC
a. Semaphore
b. Pipe
c. Shared memory
d. Buffering
Correct answer is "buffering"

4. The fol. is a part of FAT
a. Sector info
b. Disk type
c. Modified info
d. Date info
Correct answer is "Sector info"

5. Device files in UNIX are
a. Device drivers
b. Special files
c. Pipes
d. Unstructured files
correct answer is "special files"

6. The time of admission of a job to ready queue to completion is :
a. Turnaround time
b. Burst time
c. Response time
correct answer if turnaround time.

7. The fol. Signal is sent by the DMA controller :
a. HREQ
b. HLDA
c. DRQ
According to me it is all of the above, but you can also refer chapter 1 of galvin (under DMA) for the correct answer.

8. The main purpose(s) of an Operating System is/are:
a. convenience for the user
b. efficient operation of the computer system
c. optimal use of computing resources
d. All of the above
correct answer is "all of the above"

9. The signal the keyboard sends to the computer is a special kind of message called ___.
a. keyboard request
b. keyboard controller
c. interrupt controller
d. interrupt request
the correct answer is "interrupt request"

10. The available routing schemes are :
a. fixed routing

b. virtual routing
c. dynamic routing
all of the above.

11. The interval from the time of submission of a process to the time of completion is _____.
a. Turnaround time
b. Waiting time
c. Response time
turnaround time

12. The I/O subsystem consist of:
a. A memory management component including buffering, caching, and spooling
b. A general device-driver interface
c. Drivers for specific hardware devices
d. All of the above
all of the above

13. Which of the following CPU scheduling algorithms will prevent starvation problem?
a. Shortest-job-first
b. Priority-scheduling
c. Priority-scheduling with aging mechanism
d. None of the above
Priority-scheduling with aging mechanism is the correct answer.

14. Which of the following statements is true for a deadlock state
e. The system cannot run any process
f. The system can run processes barring those involved in the deadlock
g. A running process cannot request any new resource
h. All processes in the ready queue enter the wait queue
the following statements are true:
The system cannot run any process
A running process cannot request any new resource

15. The problem of thrashing may be reduced by
a. Using prepaging mechanism
b. Writing well structured programs
c. Both 1 and 2
d. Neither 1 nor 2
correct answer is neither 1 nor 2.

16. Which of the following statements is not true?
a. A directory is a special type of file
b. A directory is used to store file attributes
c. A directory is used to store file data
d. A directory is used to store file access information
all the statements are true.

17. Biometric devices are used for user authentication in
a. Proof by knowlege method
b. Challenge response method
c. Proof by possession method
d. Proof by property method
(no idea. Can check the index page of galvin)

18. A file system uses the contiguous space allocation mechanism for disk space allocation. For better utilization of disk space, this file system must use
a. A garbage collection mechanism
b. A disk compaction mechanism
c. A linked-block allocation mechanism
d. An indexed-block allocation mechanism
correct answer is d) or c)

19. Which of the following statements is true?
a. A computer virus is a complete program that makes active attacks
b. A computer virus is a program segment that makes passive attacks
c. A logic bomb is a program segment that makes passive attacks
d. A logic bomb is a program that makes active attacks
search for this answer in the chapter of galvin.

20. The purpose of virtual memory system is to
a. Allow multiprocessing
b. Allow multiprogramming
c. Allow batch processing
d. Allow execution of a program that requires larger memory than the size of the physical main memory
correct answer is d).

21. The context of a process is the union of it's _____ .
a. region tables, u area, system level context
b. register context, pregion tables, user level context
c. system-level context, register context, user-level context
d. process table, user-level context, register context

22. Which of the following is NOT a part of a process control block :
a. Values of CPU registers
b. CPU scheduling information
c. Memory limits of the process
d. List of files accessible to the process.
Correct answer is b)

23. Suppose the architecture of a computer system is layered into the following four layers -
1) Operating systems software
2) users' applications software
3) hardware
4) programming environment software
Which of the following is a logical sequence of the four layers from bottom to top?
a. 1, 2, 3, 4
b. 1, 3, 4, 2
c. 3, 1, 4, 2
d. 3, 4, 1, 2
correct answer is 3,1,4,2

24. A Job Control Language is used for
a. telling the system about a job's resource requirements
b. telling the system administrator / operator about job's resource requirements.
c. telling the programmer how to program the resource requirements of a job.
d. none of the above
my guess is d), but I am not very sure.

25. Which was the first processor to introduce protected mode?
a) 8086
b) 80286
c) 80386
d) 80486
the correct answer is 80286.

26. The protected mode is necessary for -
a) multi-tasking system
b) multi-user system
c) both a and b
d) 16 bit programming
correct answer is c)

27. The segmented memory is provided mainly …

a) for higher speeds
b) to maintain compatibility with old processors
c) for ease of application programming
d) simple hardware
correct answer is c)

28. Which of the following features is NOT found in RISC architectures ?
a) A limited instruction set
b) A large number of registers
c) Virtual memory
d) A large number of execution modes

29. The first CPU with P6 architecture was -
a) Pentium
b) Pentium Pro
c) Pentium II
d) Pentium III
Pentium pro

30. The fastest storage element is -
a) CD-ROM
b) DRAM
c) EDO-DRAM
d) SDRAM
SDRAM

31. Which peripheral requires the highest data transfer rate?
a) Sound Card
b) Network card
c) Hard disk
d) Graphics Adapter
graphics adapter

32. A virtual memory is required for -
a) increasing the speed
b) increasing the addressing modes
c) overcoming the size limitation of main memory
d) overcoming the size limitation of cache memory
correct answer is c)

33. When fork( ) is given
a) It creates a child process
b) Allocates slot in process table
c) Returns 0 to parent & ID to child
d) All of the above
correct answer is d)

34. A TSR is a program which will
a) Be resident in the memory after termination of program
b) Be called as and when the program is executed
c) Terminate and Soon Remove the program from the memory
d) All of the above
correct answer is a)

35. CPU performance is based on
a) ALU width
b) Clock speed
c) Number of instructions executed per second
d) How well CPU interacts with the rest of the system
e) Both a and b
f) None of the above
too many options are correct.

36. 80286 the addressing scheme is _____ addressing
a) 8 bit
b) 16 bit
c) 24 bit
d) 28 bit
e) 32 bit
correct answer is 16 bit.
37. Shell executes $0 and returns the
a) Parameters entered in the command line
b) Program name
c) All of the above
correct answer is b)

38. .profile file is present in
a) /usr
b) /usr/user1
c) /etc/admin
d) None of the above
correct answer is d)

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b. Priority-scheduling
c. Priority-scheduling with aging mechanism
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correct answer is c)

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c. A running process cannot request any new resource
d. All processes in the ready queue enter the wait queue
(already solved above)

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(already solved above)

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b. Challenge response method
c. Proof by possession method
d. Proof by property method

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a. A garbage collection mechanism
b. A disk compaction mechanism
c. A linked-block allocation mechanism
d. An indexed-block allocation mechanism
(already solved above)

45. Peak Bandwidth of a 64-bit, 33 MHz based PCI bus would be:
a. 133 MB/s
b. 266 MB/s
c. 512 MB/s
d. 33 MB/s
correct answer is d)

46. Main advantage of EISA bus over micro-channel bus was:
a. It offered more bandwidth over micro-channel
b. It had software configurable devices
c. It was backward compatible with ISA
d. It made the existing peripherals run faster.
(out of syllabus)

47. Which of the following devices is asynchronous ?
a. SSRAM
b. EPROM
c. Disk controllers
d. All of the above.
Correct answer is disk controllers.

48. Which of the following operating systems is available for non-intel platforms ?
a. Windows-NT
b. Solaris
c. linux
d. all of the above.
Correct answer is 'all of the above'

49. In the systems which do not have multiple CPUs, is the 'cache coherency' an issue while design?
a. Yes b. No
correct answer can be found in chapter 1 of galvin.

Q.4 SELECT TRUE OR FALSE: (1 mark each)
1. It is possible to have a deadlock involving only a single process. **FALSE**
2. Unix is a network operating system. **TRUE**
3. All entries in FAT correspond to clusters. **TRUE**
4. A Device controller is a piece of hardware. **TRUE**
5. Round Robin understands priority. **FALSE**
6. SJF is the best scheduling policy. **TRUE**
7. Paging allows protection. **TRUE**
8. Circuit switching has two variants – connection oriented and connectionless. **FALSE**
9. LANs cover a radius of upto 10km. **TRUE**
10. Cipher text is decrypted text.
11. During system startup, program execution begins at addr FFF0H.
12. A virus is a type of worm. **TRUE**
13. Spooling uses the disk as a huge buffer, for reading as far ahead as possible on input devices and for storing output files until the output devices are able to accept them. **TRUE**
14. Ready queue in CPU scheduler is always a first-in, first-out (FIFO) queue. **FALSE**

PLEASE NOTE: DESCRIPTIVE ANSWERS ARE NOT ASKED DURING DAC EXAMS. HENCE, I HAVE NOT SOLVED THE BELOW QUESTIONS. ALSO, THE ABOVE ANSWERS ARE AS PER MY KNOWLEDGE AND UNDERSTANDING ☺☺☺

Q.5 Short Answer Questions: (3 mark each)
1. A process can change its state from block state to run state. Is this statement True or False? Justify your answer.
2. Differentiate between the CPU bound process and I/O bound process.
3. Can we prevent deadlocks by denying mutual-exclusion condition? Justify your answer.
4. What do you mean by locality of reference?
5. What is a dirty bit? Why is it used?
6. What is the difference between circuit switching and packet switching?

7. Justify the statement :
“It is possible to support multiprogramming without using timesharing. However it is impractical to support timesharing without using multiprogramming”
8. Justify the statement :
“Swapping improves/degrades the efficiency of system utilization”.
9. Describe the cause of READYÅ RUNNING transition.
10. What do you mean by “protection” incase of operating systems? How is it implemented?
11. What is Access Control List? Where is it used?
12. What is a deadlock? How does it occur?
13. What do you mean by scalability?
14. What is a capability list? Where is it used?
15. Comment on the statement:
“Interactive processes should have low/high priority”
16. Name secondary storage devices and explain where they are typically used.
17. Which type of scheduler controls the degree of multiprogramming?
18. What is a race condition?
19. Which condition(s) is/are very necessary for a deadlock. Justify your answer.
20. What do you mean by a “kernel”?
21. What do you mean by the “context” of a process?
22. Give one difference between a .COM file and .EXE file in DOS.
23. Name the necessary conditions for a deadlock.
24. What is a critical section?
25. What is IOCS? What are it functions?
26. Explain advantages of distributed operating systems:
27. Name different scheduling policies and explain.
28. Differentiate between the logical address space and physical address space.
29. Explain in brief what you mean by:
1.Multiprogramming
2.Multiprocessing.
30. Name the five typical file operations.
31. Draw a block diagram showing the process transitions.
32. A process can change its state from block state to run state. Is this statement True or False? Justify your answer.
33. Can we prevent deadlocks by denying mutual-exclusion condition? Justify your answer.
34. How many different types of files are possible on UNIX operating system ? Name them.
35. What is demand paging?
36. Explain Distributed processing with the help of examples.
37. Differentiate between contiguous and non-contiguous memory allocation.
38. What Is deadlock? Give an example.
39. Explain the following: (3 marks each)
a) Semaphores
b) Disk caching
c) Working set
d) Locality of reference
e) DMA
f) Non-preemptive OS

Q.6 Long answer Questions: (4 mark each)
1. Consider a memory with 4 page frames, assuming that pages of a process are referenced in the following order:
4,3, 2,1,4,3,5,4,3,2,1,5,2.
1. Show, which would be better FIFO or LRU.
2. Considering the above reference string show how Belady’s anomaly occurs in case of FIFO.
3. How is memory re-used?
4. With the help of an example show the mapping from virtual address space to physical address space in case of virtual memory.
5. List the fields of the FCB and explain their use.
6. What is the difference between thread, process and Task?
7. What is the critical section problem? How is it handled?
8. Which condition(s) is/are very necessary for a deadlock? Justify your answer.

9. Discuss the use of Active file tables.
10. What constitutes the environment of a process?
11. What do you mean by “static and dynamic binding”?
12. What do you mean by an Inode? Where is it used?
13. How can a deadlock be avoided? Explain.
14. Write in detail the methods of LRU implementation.
15. Explain State Transition Diagram.
16. What is Inter-process communication?
17. Define the terms: Thread; process; Context of a process.
18. Describe the PC architecture with a block diagram
19. Discuss the various issues involved in Process Management