Final Exam

Computer Architecture

Name:_____

100 points
Choose the most correct answer

1) The abstract interface between the hardware and the lowest-level software that encompasses all the information necessary to write a machine language program that will run correctly, including instruction set, registers, memory access and I/O is known as the

a. Architecture b. CPU c. Computer Design d. ALU

2) The architected means for the operating system to regain control over both the hardware and the application tasks by handling the cause of a disruption of the normal program flow:

a. check b. interruption c. failure d. signaling

3) Which is NOT a goal in designing a computer architecture?

a. Speed b. Simplicity c. Bigger and More is better d. Make the Common Case fast

4) Which is NOT a hardware component that must be simultaneously engineered when building a computer architecture?

a. Registers b. Fixed Storage Locations c. Cache Size d. Program Status Word

5) More circuitry cannot be practically packed into a smaller space in current chips because of the problem of:

a. too hard to manipulate b. quantum effects c. optical effects d. heat dissipation

6) This is a technique that exploits parallelism using a single CPU among the instructions in a sequential stream of instructions.

a. streaming b. multiprocessing c. pipelining d. threading

7) This principle states that programs tend to access a relatively small contiguous portion of their address space (instructions and data) in a relatively small interval of time.

a. reference b. page state c. accessibility d. locality

8) These are used so that the CPU can be reprogrammed "on the fly" to accomodate different instruction formats during program execution.

a. control signals b. switching signals c. data signals d. clock_edge signals

9) This situation occurs in CPU processing where the next instruction cannot execute due to conditions set up by a prior instruction.

a. program check b. exception c. pipeline hazard d. hardware interruption

10) The part of an application that consists of the pages that the operating system considers to exhibit a high degree of locality is known as:

a. working-set b. local pages c. least-referenced d. thrashers

11) Relatively smaller, faster memory in which is stored copies of the most recently executed instructions and data accessed from the most frequently used slower-level memory locations.

a. cache b. registers c. internal buffers d. flash memory

12) A simple address space that can accommodate running only one application at a time is called:

a. dynamic address b. partitioned c. lone address space d. single contiguous allocation

13) Suspending operations and then percolating the active portion of each storage partition, collecting the fragments and thereby leaving a single space of unallocated memory is called:

a. relocation b. suspension c. page re-addressing d. refragmenting

14) Real storage is broken up into manageable, same sized divisions or quantities called _____ to facilitate moving data between real and auxiliary storage.

a. fragments b. slots c. page frames d. swap spaces

15) Rather than using a clock this type of I/O operation uses this for coordinating the transmission of data between sender and receiver:

a. RF signals b. smoke signals c. electromagnetic waves d. handshaking protocol

16) CPU clocking defines when _____ can be read and when they can be written by the CPU stages; as well as the interval in which a unit of work must be executed.

a. devices b. signals c. memory d. storage

17) Unexpected *software* events, such as arithmetic overflow, that cause a change in the control of program flow that are then intercepted by the hardware are called:

a. exceptions b. check-stops c. interruptions d. errors

18) The application of the locality principles employing a structure that uses multiple levels of memories:

a. locality scheme b. memory hierarchy c. locality application d. multi-dimensional memory

19) The name given for the technique that uses real addressable memory as a cache for auxiliary storage is known as:

a. relocation b. DAT processing c. segmentation d. virtual storage

20) A combination of hardware and OS software mechanisms that map a virtual address to a physical address prior to execution by the CPU is called:

a. swapping b. virtual mapping c. caching d. dynamic address translation

21) The memory management scheme that addressed the problem of not being able to run applications that exceeded the size of real memory is called:

a. segmented memory b. dynamic partitioning c. demand paging d. relocatable memory

22) This instruction is used to introduce a stall in CPU processing and to add elasticity without loss of information or computational results:

a. NOP b. WAIT c. SUSPEND d. PAUSE

23) The type of cache where the cache structure is one in which a memory block is placed in one of the multiple partitioned areas of the cache. (like a table of contents)

a. direct mapped b. fully associated c. partially associated d. set associated

24) This measure of performance regarding memory hierarchies involves the percentage of time target data if found in an upper level.

a. cache finds b. hit ratio c. hit elapsed time d. penalty misses

25) This type of bus using a communication protocol for coordinating transmission of data rather than using a clock, and thereby eliminating clock skew problems:

a. synchronous b. clockless bus c. asynchronous d. half-duplex

26) An event that occurs when the attempted accessed page is found not to be present in real memory is known as:

a. page fault b. page penalty c. addressing fault c. DAT fault

27) An operating environment that provides emulation methods that present and replicate a standard architectural interface to their guests operating systems is known as:

a. para-operating system b. emulated system c. BIOS d. Virtual Machine

28) The measure of *continuous* service accomplishment, also known as the *mean time to failure* is:

a. repairability b. reliability c. recoverability d. serviceability

29) This is NOT a challenge to getting better performance and efficiency by exploiting parallel processing programming on a multiprocessor.

a. serialization techniques b. programmer education in parallelism
c. building faster CPUs d. synchronization of processes

30) The ability to isolate each program from inadvertant or malicious interaction with other programs was brought about by this storage management technique:

a. virus protection b. multiple address spaces c. demand paging d. relocation

31) Which is NOT a type of CPU pipeline hazard.

a. structural b. control c. data d. timing

32) The process of rapidly and often checking the status of an I/O device to determine its completion or need for service is called:

a. wait-for-interrupt b. scanning c. polling d. retry

33) A *mask* is used against various bits of the Program Control or PSW Register to allow or leave pending incoming interrupts by _____ the interruptions.

a. redirecting b. queueing c. discarding d. disabling/enabling

34) A mechanism designed to offload the CPU by having a device controller manage the transfer of data directly between the I/O device and memory is called:

a. control unit b. DMA c. flashcopy d. I/O bus

35) The theoretical increase in speed achievable with pipeline processing is proportional to the number of:

a. clock cycles b. instructions processed c. heat radiated d. stages

36) The computer architecture prevents application programs from communicating directly with devices by keeping (or reserving) the I/O subset of the instruction set as:

a. hidden b. disabled c. problem-state d. privileged

37) The array residing in real storage, that is maintained by the operating system, used by the architecture to correlate a referenced virtual page to that of a real page frame is called:

a. Page Map Table b. Relocation Table c. DAT Table d. Reference Table

38) The measure of service accomplishment with respect to the *alternation* between the states of service accomplishment and service interruption; the ratio also known as uptime.

a. alternability b. serviceability c. availability d. reliability

39) Running multiple, generally independent and asynchronous tasks on a single processor where each task is given a share of the computing resources is known as:

a. multiforking b. multithreading c. serialization d. parallelism

40) This software invention provided virtualization of unit record equipment, thereby relieving the need to have a dedicated set of printers, card readers and card punches for each running partition.

a. virtual memory b. address spaces c. segmentation d. spooling

41) Virtual Machine type operating systems accomplish their ability to emulate architectural environnments for their guests by essentially acting as an elaborate _____ interrupt handler.
a. External b. Input/Output c. Program Check d. Supervisor Call

42) A series of steps in which the sender and receiver proceed to the next step only after both parties agree that the current step has completed.
a. handshaking protocol b. synchronicity c. coordination process d. skewing

43) This hardware switching technique is employed to increase processor utilization when the current thread is found to be stalled, waiting or yielding.
a. process shifting b. hyperthreading c. multiswitching d. task sharing

44) The principle of locality states that data location once referenced may likely have subsequent references access data in the same neighborhood is locality known as:
a. Temporal b. Ephemeral c. Least Referenced d. Spatial

45) The RAID scheme that replicates the data across multiple *sets* of hard drives for redundancy reasons is called:
a. Striping b. Replication c. Interleaving d. Mirroring

46) The RAID scheme that spreads the data physically across multiple hard drives, primarily for increased *access performance* is called:
a. Striping b. Replication c. Interleaving d. Mirroring

47) The term given to the operating system that is recognized by the hardware as being the owner of the real processor is:
a. first booted b. BIOS c. native d. VM

48) Adjustment and manipulation of a guest operating system's PSW, operating status, I/O completion and fixed storage data by the hypervisor when performing a *privileged* operation on the guest's behalf is called:
a. reflection b. inception c. correction d. magic

49) The goal of a memory hierarchy used in computing is to present the user with as much memory as is available using the _____technology, ….
a) greatest b) best c) least expensive d) most superior

50) (continued…) while at the same time providing access speed that as close as possible to that offered by the _____ memory.
a) shortest b) fastest c) cheapest d) largest