



ਪੰਜਾਬ ਟੈਕਨੀਕਲ ਯੂਨੀਵਰਸਿਟੀ ਜਲੰਧਰ

PUNJAB TECHNICAL UNIVERSITY JALANDHAR

Max. Marks: 90

Time: 90 Mins.

Entrance Test for Enrollment in Ph.D. Programme

Important Instructions

- Fill all the information in various columns, in capital letters, with blue/black ball point pen.
- Use of calculators is not allowed.
- All questions are compulsory. No negative marking for wrong answers.
- Each question has only one right answer.
- Questions attempted with two or more options/answers will not be evaluated.

Stream (Engg./Arch./Pharm./Mgmt./App.Sci./Life Sci.)

ENGINEERING

Discipline / Branch

COMPUTER ENGINEERING

Name

Father's Name

Roll No.

Date: 19-11-2011

Signature of Candidate

Signature of Invigilator

Q. 1 The result of the following conversion
(12A7C)₁₆ to (?)₈ is

- (A) 224174
- (B) 425174
- (C) 6173
- (D) 225174

Q. 2 Binary multiplication 1*0=

- (A) 1
- (B) 0
- (C) 10
- (D) 11

Q. 3 Two 16:1 and one 2:1 multiplexers can be connected to form a

- (A) 8:1 multiplexer
- (B) 16:1 multiplexer
- (C) 32:1 multiplexer
- (D) 64:1 multiplexer

Q. 4 A master slave JK flip flop is effectively a combination of

- (A) a SR flip flop and a T flip flop
- (B) an SR flip flop and a D flip flop
- (C) a T flip flop and a D flip flop
- (D) Two T flip flops

Q. 5 The expression for sum of A and B in the half adder is given by

- (A) AB
- (B) A+B
- (C) A Ex-or B
- (D) None of these

Q. 6 How many flip flops are required to divide the input frequency by 64

- (A) 4
- (B) 5
- (C) 6
- (D) 8

Q. 7 Which of the following binary number is same as 2's complement

- (A) 1010
- (B) 0101
- (C) 1000
- (D) 1001

Q. 8 A de-multiplexer is also called

- (A) Data selector
- (B) Data distributor
- (C) encoder
- (D) none of these

Q. 9 In a 3 input NOR gate, the number of states in which output is 1 equals

- (A) 1
- (B) 2
- (C) 3
- (D) 4

Q. 10 When an attempt to divide by zero is made what interrupt is generated?

- (A) Supervisor Control interrupt
- (B) Program interrupt
- (C) I/O interrupt
- (D) None of the above

Q. 11 When a subroutine is called, the address of the instruction following the CALL instructions stored in/on the

- (A) stack pointer
- (B) accumulator
- (C) program counter
- (D) stack

Q. 12 In immediate addressing, the operand is placed

- (A) in the CPU register
- (B) in the instruction
- (C) in the memory
- (D) in the stack

Q. 13 A parallel interface

- (A) Is one that moves information 1 bit at a time over a single wire.
- (B) Is used with RS-232 standard
- (C) Moves 8 or more data bits at a time
- (D) Is never used to connect printers to PC

Q. 14 Shifting of a program from one of the memory address to another is

- (A) Binding
- (B) Data transmission
- (C) Relocation
- (D) Allocation

Q. 15 An instruction used to set the Carry flag in a computer is classified as

- (A) Data transfer
- (B) arithmetic
- (C) logical
- (D) program control

Q. 16 RAID configurations of disks are used to provide

- (A) Fault tolerance
- (B) High speed
- (C) High data density
- (D) None of these

Q. 17 Microprogramming is designing of

- (A) ALU
- (B) CPU
- (C) ROM
- (D) Control unit

Q. 18 How many address lines are needed to address each location in 2048x4 memory

- (A) 10
- (B) 11
- (C) 12
- (D) 8

Q. 19 The capacity of a drum, which is 5 inch high, 10 inch diameter, has 60 tracks per inch with a density of 800 bits per inch?

- (A) 942000 bytes
- (B) 471000 bytes
- (C) 188400 bytes
- (D) 16384 bytes

Q. 20 Index register in a microprocessor is used for

- (A) Indirect addressing
- (B) Polling to the stack address
- (C) Address modification
- (D) To track the no. of times a loop is executed

Q. 21 Principle of Spatial locality states that once a location is referenced

- (A) it will not be referenced again
- (B) it will be referenced again
- (C) near-by location will be referenced soon
- (D) a far-off location will be referenced next

Q. 22 Start and stop bits in serial communication are used for

- (A) Error detection
- (B) Error correction
- (C) synchronization
- (D) to speed up the communication

Q. 23 The problem of thrashing is affected significantly by

- (A) Program structure
- (B) Program size
- (C) Primary storage size
- (D) None of above

Q. 24 Which of the following piece of information does the data item provide to the compiler?

- (A) range of values
- (B) amount of memory a data element uses
- (C) the way the data is to be interpreted
- (D) all of the above

Q. 25 The best way to find an item in a sorted list implemented using an array is with

- (A) Linear search
- (B) Binary search
- (C) Random search
- (D) Direct search

Q. 26 What kind of list is the best to answer many questions such as “**what is the item at position n**”?

- (A) Circular link list
- (B) List implemented with an array
- (C) doubly linked list
- (D) single linked list

Q. 27 Suppose *ptr* points to a node in a linear link list, where node has data member named *info* and next pointer field *link*. What statement changes *ptr* so that it points to next node in the linear link list?

- (A) *ptr++*
- (B) *ptr = ptr->info->link*
- (C) *ptr = ptr->info*
- (D) *ptr = ptr->link*

Q. 28 To implement a queue as a circular array of **CAPACITY** elements, if we use *rear* as an index to the tail of the queue and *front* as an index to the head, then give the formula to calculate the position where an element should be pushed

- (A) *front*+1
- (B) (*rear* % **CAPACITY**)+1
- (C) (*rear*+1) % **CAPACITY**
- (D) (*front*+1) % **CAPACITY**

Q. 29 What is the maximum number of nodes in a binary tree of height **H**.....

- (A) 2^H
- (B) $2H+1$
- (C) 2^H-1
- (D) $2(H-1)$

Q. 30 Suppose T is a binary tree with 14 nodes, what is the minimum and maximum possible height of T

- (A) 4,14
- (B) 4,10
- (C) 5,10
- (D) 5,14

Q. 31 Tree algorithms always run in time $O(d)$, what is d?

- (A) Height of the tree
- (B) the number of nodes at level d
- (C) the number of nodes in the tree
- (D) the number of leaf nodes

Q. 32 what feature of heaps allows them to be efficiently implemented using a partially filled array?.

- (A) Heaps are binary search trees
- (B) Heaps are complete binary trees
- (C) Heaps are full binary trees
- (D) heaps contain only integer data

Q. 33 the number of edges in a spanning tree of a graph with N vertices is

- (A) $(N-1)/2$
- (B) $(N-1)$
- (C) $N(N+1)/2$
- (D) $N^2/2$

Q. 34 Which guideline is not suggested from the empirical or theoretical studies of hash tables:

- (A) Hash table size should be the product of two primes
- (B) Hash table size should be the upper of a pair of twin primes
- (C) Hash table size should have the form of $4K+3$ for some K
- (D) Hash table size should not be too near of a power of two

Q. 35 In a selection sort of n elements, how many times at most the swap function is called in the complete execution of the algorithm?

- (A) 1
- (B) n-1
- (C) $n \log_2 n$
- (D) n^2

Q. 36 Suppose we are sorting an array of eight integers in ascending order using quick sort and after the first partitioning, the array looks like this : 2, 5, 1, 7, 9, 12, 11, 10, choose correct statement.

- (A) The pivot could be 7 but it is not 9
- (B) neither 7 nor the 9 is the pivot
- (C) the pivot could be either 7 or the 9
- (D) the pivot is not the 7 but could be the 9

Q. 37 The result of expression $\sim \sim 7$ in 'C' is

- (A) 7
- (B) 1
- (C) 0
- (D) none of above

Q. 38 What is the value of x after executing the statement in 'C' `x = 011 | 0x10`

- (A) 25
- (B) 50
- (C) 10
- (D) 15

Q. 39 In 'C' language, the operand of *address of operator* can be

- (A) array name
- (B) array element
- (C) both (A) and (B)
- (D) none of the above

Q. 40 Which of the following library function in C language is used to initialize graphics hardware?

- (A) detectgraph()
- (B) intstallgraph()
- (C) installdriver()
- (D) initgraph()

Q. 41 C preprocessor does not do which of the following?

- (A) Type checking
- (B) Macro expansion
- (C) Conditional compilation
- (D) loading include file

Q. 42 which of the following C statement is syntactically correct?

- (A) `for();`
- (B) `for(; ;);`
- (C) `for(,);`
- (D) `for(;);`

Q. 43 Arrays are always passed as arguments to a function by

- (a) value
- (b) reference
- (c) depends on compiler optimization settings
- (d) depends on number of arguments

Q. 44 in C++, which is the topmost base class in the hierarchy of file stream classes

- (A) fstream
- (B) ofstream
- (C) fstreambase
- (D) ifstream

Q. 45 Which of the following is not an error handling function in C++?

- (A) fail()
- (B) bad()
- (C) good()
- (D) ok()

Q. 46 which of the following is not a correct template definition in C++?

- (A) `template <class T>`
- (B) `template < class T, class T>`
- (C) `template <class T, int x>`
- (D) `template <class T1, class T2>`

Q. 47 if template and normal functions are overloaded, then the C++ compiler will tie the function call to

- (A) normal function
- (B) template function
- (C) which is smaller in size
- (D) which requires less execution time

Q. 48 Exception handling is targeted at

- (A) compile time errors
- (B) logical errors
- (C) run-time errors
- (D) All of the above

Q. 49 The do-nothing function is nothing but

- (A) a virtual function
- (B) a friend function
- (C) a pure virtual function
- (D) a global function

Q. 50 Which is not true about polymorphism?

- (A) Polymorphism can be implemented at run time only.
- (B) To implement run-time polymorphism, we need a pointer to the base class and virtual function in base class.
- (C) when a function is declared as virtual in base class, it automatically becomes virtual in derived class.
- (D) Polymorphism provides uniform interface to access a method in a class hierarchy.

Q. 51 In which form of inheritance, you have to use virtual base class to resolve the ambiguity?

- (A) Multiple inheritance
- (B) Multilevel inheritance
- (C) Hierarchical inheritance
- (D) none of the above

Q. 52 Given a class named Book, which of the following is not a valid constructor?

- (A) Book() { }
- (B) Book (Book b) { }
- (C) Book (Book &b) { }
- (D) Book (char *author, char *title) { }

Q. 53 which of the following is not true?

- (A) Destructors are not inherited.
- (B) Destructors cannot call other member functions..
- (C) Destructors can be made virtual.
- (D) Destructors cannot be overloaded.

Q. 54 which of following is not a keyword in C++?

- (A) mutable
- (B) protect
- (C) const
- (D) static

Q. 55 what kind of variable do you use if you need to share a variable from one instance of a class to the other

- (A) register
- (B) volatile
- (C) static
- (D) auto

Q. 56 Hue of a colour is related to its

- (A) luminance
- (B) saturation
- (C) wavelength
- (D) none of these

Q. 57 pixel phasing is a technique for

- (A) shading
- (B) anti-aliasing
- (C) hidden line removal
- (D) none of above

Q. 58 random scan monitors are also referred as

- (A) vector display
- (B) stroke writing display
- (C) calligraphic display
- (D) all of above

Q. 59 which of the following devices has a relative origin?

- (A) Joystick
- (B) Trackball
- (C) Mouse
- (D) none of above

Q. 60 Which of the following system software resides in main memory always?

- (A) Text editor
- (B) Assembler
- (C) Linker
- (D) Loader

Q. 61 The output of the lexical analyzer is

- (A) a set of regular expressions
- (B) syntax tree
- (C) set of tokens
- (D) string of characters

Q. 62 Choose the correct statement

- (A) Macro definitions cannot appear within another macro definition in assembly language programs.
- (B) Overlaying is used to run a program which is longer than the address space of a computer.
- (C) virtual memory can be used to accommodate a program which is longer than the address space of a computer.
- (D) none of these

Q. 63 What are the potential problems when a DBMS executes multiple transactions concurrently?

- (A) lost update problem
- (B) the dirty read problem
- (C) the phantom problem
- (D) all of above

Q. 64 if every non-key attribute is functionally dependent on the primary key, then the relation will be in

- (A) 1 NF
- (B) BCNF
- (C) 3 NF
- (D) 4 NF

Q. 65 In E-R diagram, ellipses represent

- (A) entity sets
- (B) relationship among entity sets
- (C) attributes
- (D) link between attributes and entity sets

Q. 66 Assume transaction A holds a shared lock R. if transaction B also requests for a shared lock on R, it will

- (A) result in a deadlock situation
- (B) immediately be granted
- (C) immediately be rejected
- (D) be granted as soon as it is released by A

Q. 67 Choose the incorrect statement

- (A) Go-Back-N method requires more storage at receiving end.
- (B) selective repeat has better line utilization
- (C) selective repeat involves complex logic than Go-Back-N.
- (D) none of these

Q. 68 The method of network routing where every possible path between transmitting and receiving DTE is used is called

- (A) random routing
- (B) packet flooding
- (C) directory routing
- (D) message switching

Q. 69 A terminal multiplexer has six 1200bps terminals and 'N' 300bps terminals connected to it. The outgoing line is 9600bps. What is the maximum value of 'N'?

- (A) 4
- (B) 16
- (C) 8
- (D) 28

Q. 70 The network topology which supports bi-directional links between each possible node is

- (A) ring
- (B) star
- (C) tree
- (D) mesh

Q. 71 As network administrator, what is the subnet mask that allows 510 hosts given the IP address 172.30.0.0?

- (A) 255.255.0.0
- (B) 255.255.248.0
- (C) 255.255.252.0
- (D) 255.255.254.0

Q. 72 Aging is technique used to

- (A) increase the priority of processes that are waiting for long time
- (B) decrease the priority of processes that are waiting for long time
- (C) increase the priority of processes that are currently running
- (D) decrease the priority of processes that are currently running

Q. 73 In Round Robin CPU scheduling, as the time quantum increases, the average turn around time:

- (A) increases
- (B) decreases
- (C) remains constant
- (D) varies irregularly

Q. 74 The string 1101 does not belong to the set represented by

- (A) $110^*(0+1)$
- (B) $(10)^*(01)^*(00+11)^*$
- (C) $1(0+1)^*101$
- (D) $(00+(11)^*0)^*$

Q. 75 If a is a terminal and S, A, B are three non terminals, then which of the following are regular grammars?

- $S \rightarrow \epsilon$
- (A) $A \rightarrow aS \mid b$
 - (B) $A \rightarrow abB \mid aB$
 - (C) $A \rightarrow Ba \mid Bab$
 $A \rightarrow aB \mid a$
 - (D) $B \rightarrow bA \mid b$

Q. 76 Pumping lemma is generally used for proving

- (A) a given grammar is regular
- (B) whether two grammars are equivalent
- (C) whether two given regular expressions are equivalent
- (D) a given grammar is not regular

Q. 77 A process executes the following code
for (i=0; i<n; i++) fork ();
The total number of child processes created is

- (A) n
- (B) $2^n - 1$
- (C) 2^n
- (D) $2^{n+1} - 1$

Q. 78 The maximum data rate of a channel for a noiseless 2-kHz binary channel is

- (A) 2000bps
- (B) 4000bps
- (C) 1000bps
- (D) None of these

Q. 79 In a paged memory, the page hit-ratio is 0.35. The time required to access a page in secondary memory is equal to 100ns. The time required to access a page in primary memory is 10ns. The average time required to access a page is

- (A) 3.5 ns
- (B) 65.0 ns
- (C) 68.5 ns
- (D) 78.5ns

Q. 80 If digital data rate of 9600 bps is encoded using 8-level phase shift keying(PSK) method, the modulation rate is

- (A) 1200 bauds
- (B) 3200 bauds
- (C) 4800 bauds
- (D) 9600 bauds

Q. 81 A host is transmitting a video over the network. How does the transport layer allow this host to use multiple applications to transmit other data at the same time as the video transmission?

- (A) It uses error control mechanisms.
- (B) It uses a connectionless protocol only for multiple simultaneous transmissions.
- (C) It uses multiple Layer 2 source addresses.
- (D) It uses multiple port numbers.

Q. 82 How much time would it take to transmit a 1024×1024 image with 256 gray levels using a 56K baud modem? Transmission is accomplished in packets consisting of a start bit, a byte (8 bits) of information, and a stop bit.

- (A) 157.25 sec
- (B) 167.25 sec
- (C) 177.25 sec
- (D) 187.25 sec

Q. 83 Consider a logical address space of 8 pages of 1024 words mapped into memory of 32 frames, how many bits are there in the physical address?

- (A) 9 bits
- (B) 11 bits
- (C) 13 bits
- (D) 15 bits

Q. 84 Which of the following is not a client-server application?

- (A) Internet Chat
- (B) Ping
- (C) E-mail
- (D) Web browsing

Q. 85 A goal of data mining includes which of the following?

- (A) To explain some observed event or condition
- (B) To confirm that data exists
- (C) To analyze data for expected relationships
- (D) To create a new data warehouse

Q. 86 According to Brooks, if n is the number of programmers in a project team, then the number of communication path is

- (A) $n(n-1)/2$
- (B) $n \log n$
- (C) n
- (D) $n(n+1)/2$

Q. 87 Assertions are conditions which are true at the point of execution

- (A) always
- (B) sometimes
- (C) many times
- (D) no times

Q. 88 A program P calls two subprograms P1 and P2. P1 can fail 50% times and P2 can fail 40% times, then P can fail

- (A) 50%
- (B) 60%
- (C) 10%
- (D) 70%

Q. 89 Considering a program graph (PG) with statement as vertices and control as edges. Then, for any program Graph

- (A) PG is acyclic
- (B) PG is always directed graph
- (C) There won't be any self loops
- (D) PG will always a connected graph.

Q. 90 Which of the following is a dangling reference?

- (A) Accessing a variable, that is declared, but not initialized.
- (B) Accessing a storage that is already disposed at the request of processor.
- (C) Accessing a storage that is already disposed at the request of user.
- (D) All of these