Examination: **M.Sc Computer Science**

SECTION 1 - SECTION 1

Question No.1

The goal of hashing is to produce a search that takes _____

- O(1) time
- O(nlog n) time
- $O(n^2)$ time
- 0(log n) time

Question No.2

Associative arrays is synonymous to _____

- Simple array
- Array of strings
- Simple variable
- Hash

Question No.3

How many bits are there in the Ethernet address?

- 64 bits
- 48 bits
- 32 bits
- 16 bits

Question No.4

Which of the following is NOT an aggregate function?

- Select
- Min
- Avg
- Max

Question No.5

In a compiler, keywords of a language are recognized during

- dataflow analysis
- parsing of the program
- the lexical analysis of the program
- the code generation

Question No.6

Choose the correct statements.
I. The body of a function should have only one return statement.
II. The body of a function may have many return statements.
III. A function can return only one value to the calling environment.

- I ,II and III
- II and III
- I and II
- I and III

Question No.7

In LRU, the referenced blocks counter is set to '0' and that of the previous blocks are incremented by one and others remain same, in case of _____

- Delay
- Miss
- Hit or Miss
- Hit

Question No.8

What will be the value of x after executing the program ?

```
void main ( )
{       int x;
x = printf("I See, Sea in C");
printf("\n x= % d" , x); }
```

- x= 15
- Garbage value
- Error
- x=2

Question No.9

Which of the following in place sorting algorithm needs the minimum number of swaps?

- Insertion sort
- Quick sort
- Heap sort
- Selection sort

Question No.10

Bottom parsing involves _____

- Handle pruning
- Operator check

- Shift reduce and handle pruning
- Shift reduce

Question No.11

Physically placing the machine instructions and data into main memory is done by

- Compiler
- Loader
- Linker
- Interpreter

Question No.12

A man arranges to pay off a debt of ₹3600 in 40 annual installments which form an Arithmetic Progression (A.P). When 30 of the installments are paid, he dies leaving one-third of the debt unpaid . Find the value of the first installment.

- 51
- 55
- 49
- 53

Question No.13

In the bakery algorithm to solve the critical section problem :

- Each process gets a unique number and the one with the lowest number is served
- Each process is put into a queue and picked up in an ordered manner
- Each process receives a number (may or may not be unique) and the one with the lowest number is served next
- Each process gets a unique number and the one with the highest number is served

Question No.14

The main difference between a register and a counter is _____

- A register has no specific sequence of states
- A counter has capability to store one bit of information but register has n-bits
- A counter has no specific sequence of states
- A register has capability to store one bit of information but counter has n-bits

Question No.15

The indirect change of the values of a variable in one module by another module is called

- Side-module update
- Side effect
- Inter-module change
- Internal change

Question No.16

Step by step instructions written to solve any problem is called _____

- Assembler
- Pseudocode
- Algorithm
- Class

Question No.17

_____ is very useful in situation when data have to be stored and then retrieved in reverse order.

- Stack
- Linked List
- List
- Queue

Question No.18

The cube root of 1331 is _____

- 17
- 11
- 13
- 19

Question No.19

A data dictionary does not provide information about

- Where data is located
- Size of disk storage device
- How the data is used
- Who owns it

Question No.20

How many two-input AND and OR gates are required to realize Y = CD + EF + G?

- 2, 3
- 2, 2
- 3, 2
- 3, 3

Question No.21

Which system call returns the process identifier of a terminated child?

- Get

- Fork
- Wait
- Exit

Question No.22

If every non-key attribute is functionally dependent on the primary key, the relation will be in _____

- Second normal form
- Fourth normal form
- First normal form
- Third normal form

Question No.23

Which of the following data structure is linear type?

- Array
- Tree
- Forest
- Graph

Question No.24

A problem encountered in multitasking when a process is perpetually denied necessary resources is called

- Starvation
- Inversion
- Deadlock
- aging

Question No.25

The page table contains _____

- Base address of each page in physical memory
- Frame size
- Page offset
- Page size

Question No.26

The recurrence relation capturing the optimal execution time of the Towers of Hanoi problem with n discs is _____

- T(n) = 2T(n-1) + 1
- T(n) = 2T(n/2) + 1
- T(n) = 2T(n-1) + n
-

T(n) = 2T(n-2) + 2

Question No.27

A process stack does not contain

- Return addresses
- Local variables
- Function parameters
- PID of child process

Question No.28

66 cubic centimeters of silver is drawn into a wire 1 mm in diameter. The length of the wire in metres will be :

- 336
- 168
- 84
- 90

Question No.29

SOAP is _____

- Simplified Object Arbitrary Protocol
- Similar Object access Protocol
- Simple Object Access Protocol
- Secure Object Access Protocol

Question No.30

Views are useful for _____ unwanted information, and for collecting together information from more than one relation into a single view.

- Hiding
- Deleting
- Highlighting
- All of the above

Question No.31

If 5 boys take 7 hours to pack 35 cartoons, then how many boys can pack 66 cartoons in 3 hours?

- 26
- 45
- 39
- 22

Question No.32

In a class each of the students contributed as many paise as there are number of students. If the total collection was Rs. 64, what is the number of students in the class?

- 82
- 85
- 80
- 90

Question No.33

Page stealing is _____

- Taking larger spaces for pages paged out
- A sign of an efficient system
- Taking page frames from other working sets
- Should be the tuning goal

Question No.34

What is the minimum number of stacks of size n required to implement a queue of size n?

- Three
- Four
- Two
- One

Question No.35

A process is _____

- Contents of main memory
- A program in high language kept on disk
- A job in secondary memory
- A program in execution

Question No.36

What is the asymptotic runtime for traversing all nodes in a binary search tree with n nodes and printing them in order?

- $O(n^2)$
- O(nlog(n))
- O(log n)
- O(n)

Question No.37

The number of full and half-adders required to add 16-bit numbers is

- 8 half-adders, 8 full-adders

- 16 half-adders, 0 full-adders
- 4 half-adders, 12 full-adders
- 1 half-adder, 15 full-adders

Question No.38

The smallest integer that can be represented by an 8-bit number in 2's complement form is?

- -128
- 0
- -127
- -256

Question No.39

_____ provides a connection-oriented reliable service for sending messages.

- DHCP
- IP
- TCP
- UDP

Question No.40

What is compaction?

- A technique for overcoming internal fragmentation
- A technique for overcoming external fragmentation
- A technique for overcoming fatal error
- A paging technique

Question No.41

Annual income of A is 10% more than of B whereas income of B is 20% more than that of C. If monthly income of C is $ 2000 then what is the sum of monthly incomes of A, B and C?

- 7772
- 7046
- 7040
- 6872

Question No.42

Bridge works in which layer of the OSI model?

- Application Layer
- Network Layer
- Datalink Layer
- Transport layer

Question No.43

When the process requests for a DMA transfer

- Process is temporarily suspended and another process gets executed
- The process continues execution
- Another process gets executed
- Then the process is temporarily suspended

Question No.44

If an array is used as function argument, the array is passed

- by reference
- by name
- by value
- the array cannot be used as a function argument

Question No.45

In a two pass assembler the object code generation is done during the _____

- Not done by the assembler
- Second pass
- First pass
- Zeroeth pass

Question No.46

The usefulness of signals as a general inter process communication mechanism is limited because :

- They are system generated
- They are user generated
- They do not work between processes
- They cannot carry information directly

Question No.47

Consider a schema R(A, B, C, D) and functional dependencies A → B and C → D. Then the decomposition R1(A, B) and R2(C, D) is

- Lossless Join
- Dependency preserving but not lossless join
- Dependency preserving and lossless join
- Lossless Join but not dependency preserving

Question No.48

In a two digit number, the digit in the unit's place is two more than the three times of the digit in ten's place. If the sum of the two digits is 6, the number is _____

- 51
- 42
- 15
- 24

Question No.49

What are the components of a cloud computing environment?

- application, platform, infrastructure
- client, application, platform, infrastructure, server
- client, application, session, network, data
- application, presentation, transport, network, data

Question No.50

A RAM chip has a capacity of 1024 words of 8 bits each (1K × 8). The number of 2 × 4 decoders with enable line needed to construct a 16K × 16 RAM from 1K × 8 RAM is

- 6
- 7
- 5
- 4

Question No.51

Nisha is 15 years elder to Romi. If 5 years ago, Nisha was 3 times as old as Romi, then find Nisha's present age.

- 25 years
- 24.9 years
- 27.5 years
- 32.5 years

Question No.52

In an entity-relationship diagram "Diamonds" represents

- Weak entity set
- Multi-valued attributes
- Attributes
- Relationship sets

Question No.53

The first term of an Arithmetic Progression is 15 and the last term is 85. If the sum of all terms is 750, what is the 6th term?

- 45
- 40
-

30

55

Question No.54

Which of the following IP address class is multicast?

- Class B
- Class D
- Class A
- Class C

Question No.55

Multiplexing combines signals from several sources to achieve _____

- Data rate management
- Bandwidth efficiency
- Interleaving
- TDM efficiency

Question No.56

Which of the following is true regarding referential integrity?

- Every primary-key value must match a primary-key value in an associated table
- Every foreign-key value must match a foreign-key value in an associated table
- Every foreign-key value must match a primary-key value in an associated table
- Every primary-key value must match a foreign-key value in an associated table

Question No.57

The fastest data access is provided using _____

- Caches
- SRAMs
- Registers
- DRAMs

Question No.58

What is the scope of an external variable?

- From the point of declaration to the end of the file being compiled
- Any source file in a program
- From the point of declaration to the end of the file in which it is defined
- Whole source file in which it is defined

Question No.59

Information is _____

- Raw data
- Organized data
- Processed data
- Input data

Question No.60

In the beginning, Ram works at a rate such that he can finish a piece of work in 24 hrs, but he only works at this rate for 16 hrs. After that, he works at a rate such that he can do the whole work in 18 hrs. If Ram is to finish this work at a stretch, how many hours will he take to finish this work?

- 18 hrs
- 12 hrs
- 11½ hrs
- 22 hrs

Question No.61

Routing tables of a router keeps track of

- Distribute IP address to network devices
- Routes to use for forwarding data to its destination
- MAC address assignment
- Port assignment to network devices

Question No.62

The difference between simple and compound interests compounded annually on a certain sum of money for 2 years at 4 % per annum is Re. 1. The sum (in Rs.) is :

- 640
- 625
- 650
- 630

Question No.63

The Process Control Block is

- Process type variable
- A secondary storage section
- Data structure
- A block in memory

Question No.64

The address of the next instruction to be executed by the current process is provided by the

- Pipe

- Stack Pointer
- Program Counter
- CPU registers

Question No.65

Consider the following sequence of micro-operations

MBR ← PC

MAR ← x

PC← Y

Memory ← MBR

Which one of the following is a possible operation performed by this sequence?

- Instruction fetch
- Operand fetch
- Initiation of interrupt service
- Conditional branch

Question No.66

Three bells toll at the intervals of 10, 15 and 24 minutes. All the three begin to toll together at 8 A.M. At what time they will again toll together

- 9.25AM
- 10AM
- 8.50AM
- 10.45AM

Question No.67

A right triangle with sides 3 cm, 4 cm and 5 cm is rotated the side of 3 cm to form a cone. The volume of the cone so formed is :

- $12\pi cm^3$
- $15\pi cm^3$
- $20\pi cm^3$
- $16\pi cm^3$

Question No.68

Which loop is most suitable to first perform the operation and then test the condition?

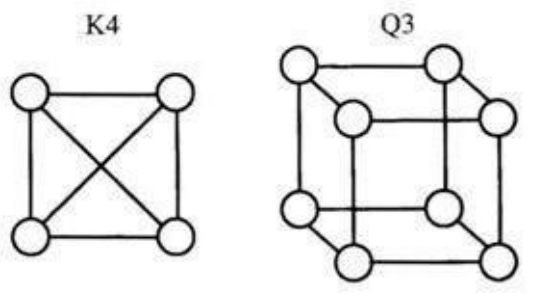
- For loop
- If then else
- While loop
- Do-while loop

Question No.69

The degree of multiprogramming is

- The number of processes executed per unit time
- The number of processes in memory
- The number of processes in the I/O queue
- The number of processes in the ready queue

Question No.70



- Neither K4 nor Q3 are planar
- Q3 is planar while K4 is not
- Both K4 and Q3 are planar
- K4 is planar while Q3 is not

Question No.71

The postfix expression for the infix expression A + B*(C+D)/F + D*E is

- AB+CD+*F/D+E*
- A+*BCD/F*DE++
- A*B+CD/F*DE++
- ABCD+*F/DE*+

Question No.72

Which data structure is used by malloc() for object creation?

- Tree
- Heap
- Queue
- Stack

Question No.73

A bag contains 2 red, 3 green and 2 blue balls. Two balls are drawn at random. What is the probability that none of the balls drawn is blue?

- 10/21

- 2/7
- 11/21
- 5/7

Question No.74

A minimum of _____ variable(s) is/are required to be shared between processes to solve the critical section problem.

- Two
- One
- Three
- Four

Question No.75

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

- Efficiency
- Throughput
- Capacity
- Output

Question No.76

Consider the following context free grammar over the alphabet $\Sigma = \{a,b,c\}$ with S as the start symbol

$S \rightarrow abScT \mid abcT$

$T \rightarrow bT \mid b$

Which of the following represents the language generated by the above grammar?

- $\{(ab)^n\ cb^{m1}\ cb^{m2} \ldots\ Cb^{mn} \mid n, m_1, m_2 \ldots, m_n \geq 1$
- $\{(ab)^n (cb^m)^n \mid m, n \geq 1\}$
- $\{(ab)^n (cb^n)^m \mid m, n \geq 1\}$
- $\{(ab)^n (cb)^n \mid n \geq 1\}$

Question No.77

If a = 5 and b = 7 then the statement p = (a > b) : a ? b

- assigns a value 7 to p
- gives an error message
- assigns a value 5 to p
- assigns a value 8 to p

Question No.78

Regarding the scope of the variables identify the incorrect statement:
[A] Automatic variables are automatically initialized to 0
[B] Static variables are automatically initialized to 0
[C] The address of a register variable is not accessible
[D] Static variables cannot be initialized with any expression

- A
- B
- C
- D

Question No.79

The simplified SOP (Sum Of Product) form of the boolean expression (P + Q' + R') . (P + Q' + R) . (P + Q + R') is

- (P'.Q + R')
- (P'.Q + R)
- (P.Q + R)
- (P + Q'.R')

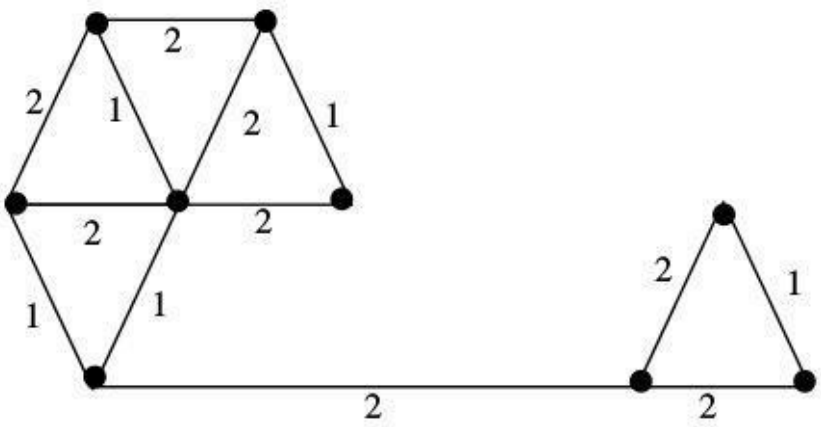
Question No.80

Find the least number by which 750 should be multiplied, so that it becomes a perfect cube.

- 36
- 12
- 24
- 48

Question No.81

The number of distinct minimum spanning trees for the weighted graph given below is ____



- 7

- 4
- 5
- 6

Question No.82

Linked lists are best suited for _____

- Relatively permanent collections of data
- The size of the structure and the data in the structure are constantly changing
- Both a & b
- Neither a or b

Question No.83

Which of the following is a volatile memory?

- RAM
- ROM
- EEPROM
- Compact Disc

Question No.84

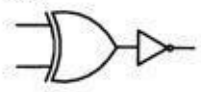
Run time mapping from virtual to physical address is done by _____

- ALU
- MMU
- PCI
- CPU

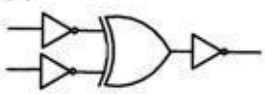
Question No.85

Which one of the following circuits is NOT equivalent to a 2-input XNOR (exclusive NOR) gate?

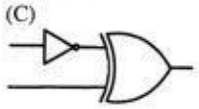
(A)



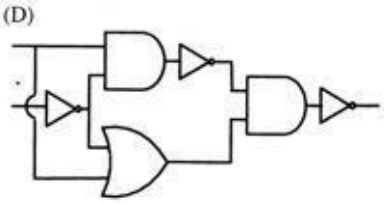
(B)



(C)



(D)



- D
- C
- B

- A

Question No.86

Two trains running in opposite directions cross a man standing on the platform in 27 seconds and 17 seconds respectively and they cross each other in 23 seconds. The ratio of their speeds is :

- 3:4
- 3:2
- 1:3
- 3:5

Question No.87

What is the output of this C code?

```
#include <stdio.h>
void m(int x)
    {
     x++;
     }
int main()
{
      register int x = 5;
      m(x);
      printf("x is %d", x);
 return 0;
}
```

- 5
- Garbage value
- 0
- 6

Question No.88

The curved surface area of a cylindrical pillar is 264 m^2 and its volume is 924 m^3. Find the ratio of its diameter to its height.

- 6:7
- 3:7
- 7:3
- 7:6

Question No.89

In a _____ index, an index entry appears for only some of the search-key values.

- Straight

- Continuous
- Dense
- Sparse

Question No.90

Let P be a quicksort program to sort numbers in ascending order using the first element as pivot. Let t1 and t2 be the number of comparisons made by P for the inputs {1, 2, 3, 4, 5} and {4, 1, 5, 3, 2} respectively. Which one of the following holds?

- t1 = 5
- t1 < t2
- t1 > t2
- t1 = t2

Question No.91

Which concept of object oriented programming is a way of converting real world objects in terms of class?

- Abstraction
- Polymorphism
- Encapsulation
- Inheritance

Question No.92

The average of first 50 natural numbers is _____

- 25
- 25.3
- 12.25
- 25.5

Question No.93

How many bricks, each measuring 25 cm X 11.25 cm X 6 cm, will be needed to build a wall of 8 m X 6 m X 22.5 m?

- 6000
- 5600
- 6400
- 7200

Question No.94

Output of the program given below is

```
int i;
main()
{
printf("%d", i);
}
```

- .Null
- -1
- 0
- 1

Question No.95

A binary search tree whose left subtree and right subtree differ in height by utmost 1 unit is called _____

- AVL tree
- Red-black tree
- B-tree
- Lemma tree

Question No.96

For an undirected graph with n vertices and e edges, the sum of the degree of each vertex is equal to _____

- $(e^2 + 1)/2$
- 2n
- 2e
- (2n-1)/2

Question No.97

In the _____, one transaction inserts a row in the table while the other transaction is half way through its browsing of table.

- One way read problem
- Phantom read problem
- Serial read problem
- Transaction read problem

Question No.98

The minimum number of D flip-flops needed to design a mod-258 counter is.

- 258
- 512
- 8
- 9

Question No.99

The complexity of merge sort algorithm is _____

- O(log n)
- O(n)
- O(nlogn)
- $O(n^2)$

Question No.100

The wages of 10 workers for a six-day week is $ 1200. What are the one day's wages of 4 workers?

- 80
- 24
- 32
- 40