ENTRANCE EXAMINATION – (2022 – 23)

SET C

ROLL NO   M 5 1 1 2 1 0 7

Nabish
Signature of Invigilator

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New Delhi

Time: 1 HOUR 30 MINUTES   **Total Marks: 100**

Instructions to Candidates

1. Do not write your name or put any other mark of identification anywhere in the OMR Response Sheet. IF ANY MARK OF IDENTIFICATIONS IS DISCOVERED ANYWHERE IN OMR RESPONSE SHEET, the OMR sheet will be cancelled, and will not be evaluated.

2. **This Question Booklet contains the cover page and a total of 100 Multiple Choice Questions of 1 mark each**

3. Space for rough work has been provided at the beginning and end. Available space on each page may also be used for rough work.

4. There is negative marking in Multiple Choice Questions. For each wrong answer, 0.25 marks will be deducted.

5. USE/POSSESSION OF ELECTRONIC GADGETS LIKE MOBILE PHONE, iPhone, iPad, page ETC. is strictly PROHIBITED.

6. Candidate should check the serial order of questions at the beginning of the test. If any question is found missing in the serial order, it should be immediately brought to the notice of the Invigilator. No pages should be torn out from this question booklet.

7. Answers must be marked in the OMR response sheet which is provided separately. OMR Response sheet must be handed over to the invigilator before you leave the seat.

8. The OMR response sheet should not be folded or wrinkled. The folded or wrinkled OMR/Response Sheet will not be evaluated.

9. Write your Roll Number in the appropriate space (above) and on the OMR Response Sheet. Any other details, if asked for, should be written only in the space provided.

10. There are four options to each question marked A, B, C and D. Select one of the most appropriate options and fill up the corresponding oval/circle in the OMR Response Sheet provided to you. The correct procedure for filling up the OMR Response Sheet is mentioned below.

CORRECT METHOD

Ⓐ ● Ⓒ Ⓓ

WRONG METHOD

Ⓐ ⊗ Ⓒ Ⓓ   Ⓐ Ⓑ ✓ Ⓓ   ◐ Ⓑ Ⓒ Ⓓ   Ⓐ ◉ Ⓒ Ⓓ   Ⓐ ◉ Ⓒ Ⓓ   ● Ⓑ Ⓒ ●

Q1. Identify the TRUE statement(s) from the following:

    i.   Contiguous memory allocation techniques suffer only from Internal Fragmentation and not from External Fragmentation.

    ii.   Contiguous memory allocation techniques suffer from both Internal Fragmentation and External Fragmentation.

    iii.   Non-Contiguous memory allocation techniques suffer only from External Fragmentation and not from Internal Fragmentation.

    iv.   Non-Contiguous memory allocation techniques suffer from both Internal Fragmentation and External Fragmentation.

  a. Only i
  b. Only iii
  c. Both ii & iii
  d. Both i & iv

Q2. In Secondary memory access terms, the time taken to move disk arm to desired cylinder is known as

  a. Positioning Time
  b. Seek Time
  c. Rotational Latency
  d. Head Shift Time

Q3. Consider a disk pack with 32 surfaces, 64 tracks and 512 sectors per pack. 256 bytes of data are stored in a bit serial manner in a sector. The number of bits required to specify a particular sector in the disk is

  a. 20
  b. 18
  c. 21
  d. 22

Q4. As per the SSTF disk scheduling technique, which of memory requests shall be handled first from the given request queue, provided that the head is currently positioned at 67.

       Request Queue: 145, 90, 54, 89, 120, 159, 15, 59, 199

  a. 145
  b. 199
  c. 59
  d. 15

Q5. Which one of the following is used to represent the supporting many-one relationships of a weak entity set in an entity-relationship diagram? (3)

  a. Diamonds with double/bold border

b. Squares with double/bold border
c. Ovals with double/bold border
d. Ovals that contain underlined identifiers

Q6. Given two tables

   EMPLOYEE (<u>EID</u>, ENAME, DEPTNO)
   DEPARTMENT (<u>DEPTNO</u>, DEPTNAME)

Find the most appropriate statement of the given query:

   Select count (*) 'total' from EMPLOYEE where DEPTNO IN (D1, D2)
   group by DEPTNO having count (*) >5

a. Total number of employees in each department D1 and D2
b. Display total number of employees in both departments D1 and D2
c. Total number of employees of department D1 and D2 if their total is >5
d. The output of the query must have at least two rows

Q7. Consider the following two statements about database transaction schedules:

i.   Strict two-phase locking protocol generates conflict serializable schedules that are also recoverable.
ii.   Timestamp-ordering concurrency control protocol with Thomas' Write Rule can generate view serializable schedules that are not conflict serializable.

"Which of the above statements is/are TRUE?

a. Only i
b. Only ii
c. Both i & ii
d. Neither i nor ii

Q8. Let R = (A, B, C, D, E, F) be a relation scheme with the following dependencies:

   C→F, E→A, EC→D, A→B.

Which of the following is a key for R?

a. CE
b. AE
c. AC
d. CD

Q9. Which of the following control fields in TCP header is used to specify whether the sender has no more data to transmit?

a. SYN
b. FIN
c. RST
d. PSH

Q10. Consider the OSI protocol Suite and match the following:

(P) SNMP	(1) Application layer
(Q) ARP	(2) Transport layer
(R) UDP	(3) Data link layer
(S) ATM	(4) Network layer
	(5) Physical layer

    a.   P → 1, Q → 4, R → 2, S → 3

    b.   P → 2, Q → 4, R → 1, S → 3

    c.   P → 1, Q → 4, R → 2, S → 5

    d.   P → 2, Q → 1, R → 3, S → 5

Q11. The maximum payload of a TCP segment is:

    a. 65,345

    b. 65,515

   c. 65,495 ✓

    d. 65,565

Q12. The address of a class B host is to be split into subnets with a 6-bit subnet number. What is the maximum number of subnets and the maximum number of hosts in each subnet?

    a. 62 subnets and 2048 hosts.

    b. 64 subnets and 1024 hosts ✓

    c. 62 subnets and 1022 hosts.

    d. 64 subnets and 1024 hosts

Q13. Which one of the following represents a language of strings over (0, 1) such that each string has at least two 0s?

    a. (0+1)*0(0+1)0(0+1)*

    b. (0+1)*0*0(0+1)* ✓

    c. (0+1)*0(0+1)*0*(0+1)*

    d. (0+1)*0(0+1)*0(0+1)*

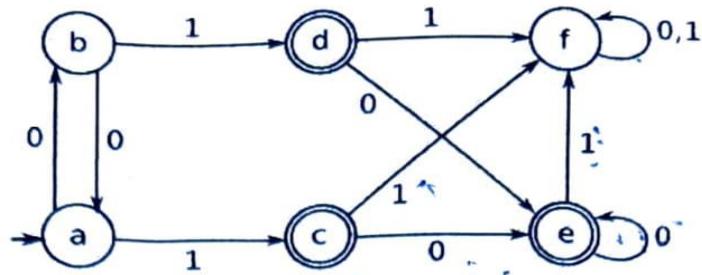**Q14.** What is the regular expression for the following DFA:

(5)
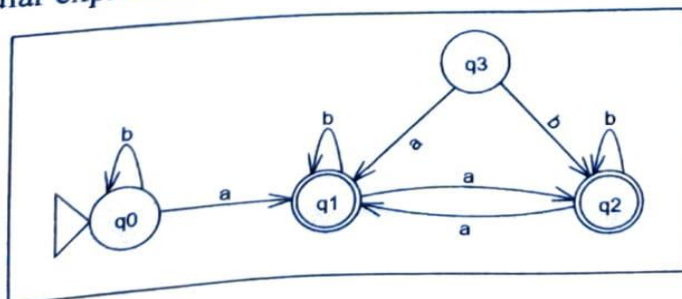
    a) b*ab*a(aa)*b*

    b) (b+a)*b*a(b+a)*

    c) (b+a)*(ba)*a(b+a)*
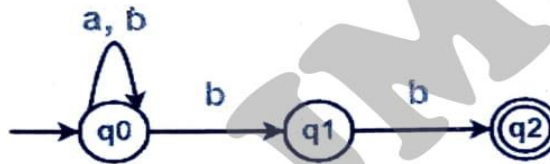
d)   b*ab*a(b+a)(aa)*b*

Q15. The set of valid sentences for the given DFA are

a)   0, 10, 011, 10
b)   010, 1000, 110, 101
c)   001, 010, 10000, 0001
d)   1, 11, 0001, 01111

Q16. The corresponding DFA for this NFA will have total _____ states (without dangling states).

a)   5
b)   4.
c)   2
d)   3

Q17. Which of the followings is the correct set of elements found in the positive closure over the strings (ab, cd)?

a)   ab, cd, abcd, ac, bd,
b)   ab, cd, cdab, abcd, abab
c)   ab, cd, aabb, cdab, cdcd
d)   ∈, abcd, cdab, cdcd, ccab,

Q18. Consider the following identities of regular expressions and select the odd one out

a.   RR* = R*R
b.   (A + B)* = (A*B*)*
c.   P(QP)* = (PQ)P*
d.   if R = Q+RP then R = QP*

Q19. As per the Chomsky classification of languages, which of the following Names does NOT represent a type of Grammar?

a)   Chomsky Normal
b)   Context Sensitive
c)   Unrestricted
d)   Context Free

Q20. Which of the following is TRUE for Pumping Lemma for Regular expressions

    i. It is used to prove that the language is regular.
    ii. The length of 'x' and 'y' components together is equal to 'k' i.e. the no of states in the FA
    iii. The length of the elements x, y and z must be >=0.
    iv. Component y of the string may or may to be equal to $\in$

    a)   i & iv
    b)   ii & iii
    c)   only iii
    d)   only iv
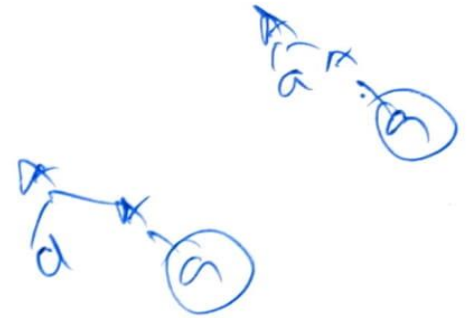
Q21. Which of the following Grammar is/are Regular?

    i. A → aA | aa.
    ii. A → aA | Aa | AA | a
    iii. A → aA | aA | aa.
    iv. A → aA | a | $\in$

    a)   i & iv
    b)   ii & iii
    c)   only iii '
    d)   only iv

Q22. What is the correct Order in which the following steps should be applied to simplify a CFG?

    i) Eliminating Variables not producing Terminals
    ii) Eliminating Variables not arriving in Sentential Forms
    iii) Eliminating Null Productions
    iv) Eliminating Chain Productions

    a)   i → ii → iii → iv
    b)   ii → i → iv → iii
    c)   iv → iii → i → ii
    d)   iii → iv → i → ii

Q23. Which of the following Grammars is/are in Chomsky Normal Form?

i.	S → AA | BB | s B → BB | b A → AA | a
ii.	S → ABA | BB | s A → aa | $\in$ B → BB | b
iii.	S → Ss | Bb | s B → b
iv.	S → BB | SB | s B → bb | $\in$

(7)

    a. i & iii

b. ii & iv
c. only i
d. only iv

Q24. Which of the followings is NOT true about Turing Machines (TM)?

a) The input tape is Bidirectional
b) The Input tape is right ended and can be extended to infinity on the left ✓
c) It is not mandatory to make a head movement even after reading / writing on the tape
d) Initially, all the cells on tape of the TM are blank

Q25. The class NP refer to

a) Problems which are Solvable in polynomial time over a Non deterministic TM
b) Problems which are Solvable in Non polynomial time over a deterministic TM
c) Problems which are Solvable in Non polynomial time over a Non deterministic TM
d) Problems which are Solvable in polynomial time over a deterministic TM

Q26. In the C Programming Language, which of the following is a lexical error?

a) intt X1;
b) char _ci;
c) float ___;
d) long int 1x;

Q27. The Syntax analyser of a compiler is commonly an implementation of a

a. Deterministic PDA
b. Non Deterministic PDA
c. Linear Bounded Automata ✓
d. Finite Automata

Q28. Select the FALSE Statement from the followings

a) For each regular language we can also design a PDA
b) For each regular language we can only design an FA
c) For each Context Free language we can also design a PDA
d) For each Unrestricted language we can also design a PDA

Q29. Select the FALSE Statement(s) for an LL(0) Parser

a. Each LL(0) parser will have its LL(1) counterpart
b. Each LL(1) parser will have its LL(0) counterpart
c. All columns of each row have the entry of the same production
d. No element from the tape is read to take a decision about the next step

Q30. Consider the following grammar.

$$X \rightarrow uYDF$$
$$Y \rightarrow YyD \mid w$$

The Follow of the non-terminal **D** is

a) {z, w, ∈, $ }
b) {z, y, $} ✓
c) {z, y, ∈, $ }
d) {z, m $ }

Q31. Which of the followings is an Ambiguous CFG?

a.	S → a | bB | c B → bB | ∈
b.	S → aA | SB | ∈ A → a | ∈ B → bB | b
c.	S → aS | bB | b B → b
d.	S → a | SB | ∈ | b B → bB | ∈

Q32. Identify the TRUE statement from the followings

a. Ambiguous CFGs can only have LL(1) parsers
b. Ambiguous CFGs can have both LL(1) & LR(1) parsers ✓
c. Ambiguous CFGs can only have LR(1) parsers
d. Ambiguous CFGs can have neither LL(1), nor LR(1) parsers

Q33. Consider the following three Address Code :

```
101    s = r / t
102    t1 = s + r
103    if t2<2 Goto 102
104    t2 = t1 / c
105    m = t1 * k
106    t3 = m * s
107    if t3 != m Goto 106
108    h = i
109    m = t3 + j
110    if t3 < 0 Goto 106
111    s = s+1
112
```

Now, what is the correct no of leaders and blocks in the above code?

a. 6 leaders 6 blocks
b. 12 leaders 6 blocks
c. 3 leaders 3 blocks
d. 3 leaders 7 blocks

Q34. Which of the following is a Valid Three Address Code statement

a. t1 = x + y/2
b. if x>y && y<z Goto Label1 ✓
c. Goto Label2
d. Call(Func1, arg1, arg2, arg3)

Q35. Consider the following Three Address Code

t1 = c + d
t2 = a − t1
t3 = e - b
t4 = t1 - t3

Now for generating the target assembly for the above code, how many registers shall be needed when both the operands must be in a register for code generation?

a. 1
b. 2
c. 3
d. 4

Q36. Select the ODD one out from the following Compiler Design concepts

a. Common SubExpression Elimination
b. Flow Graph
c. Constant Folding
d. Code Motion

Q37. Consider the following Directed Acyclic Graph and identify its optimal order of evaluation (of the interior nodes) to generate the target code.
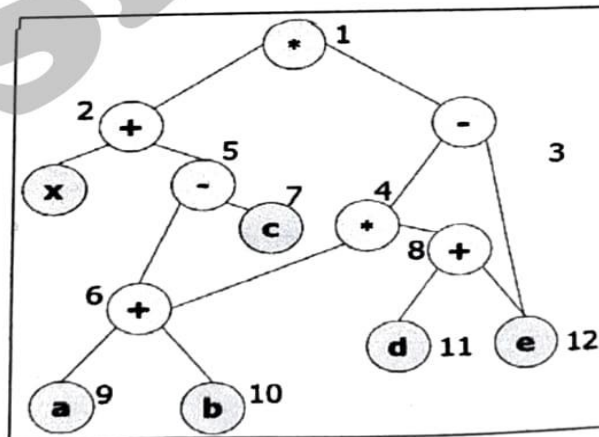
a. 1, 2, 3, 4, 5, 6, 8
b. 8, 6, 4, 3, 2, 5, 1
c. 8, 6, 5, 4, 3, 2, 1
d. 1, 2, 3, 4, 6, 5, 8

Q38. Consider the following target assembly code snippet, where '*a*' refers to a variable in the memory location and '*R0*' is a register:

MOV a, R0
ADD #1, R0
MOV R0, a

What is the total instruction cost of the above mentioned code?

    a. 3
    b. 4
    c. 6
    d. 9

Q39. Given two sorted list of size m and n respectively. The number of comparisons needed the worst case by the merge sort algorithm will be

    a. $m + n - 1$
    b. m x n
    c. maximum of m and n
    d. minimum of m and n

**Q40.** The solution of recurrence relation : $T(n)=2T(\sqrt{n})+\lg(n)$ is

    a. $O(\log (n) \log(n))$
    b. $O(n \log (n))$
    c. $O(\log (n))$
    d. $O(\log (n) \log(\log(n)))$

Q41. A graph with n vertices will definitely have a parallel edge or self-loop if the total number of edges are

    a. less than $n(n-1)$
    b. greater than $(n-1)$
    c. greater that $n(n-1)/2$
    d. less than $n^2/2$

Q42. Which type of graph has all the vertex of the first set connected to all the vertex of the second set?

    a. Cartesian
    b. Bipartite
    c. Complete Bipartite
    d. Pie
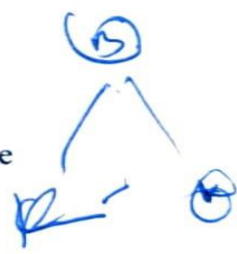
Q43. Suppose a system contains n processes and system uses the round-robin algorithm for CPU scheduling then which data structure is best suited ready queue of the processes

    a. Stack
    b. Queue
    c. circular queue
    d. tree

Q44. If a node has K children in B tree, then the node contains exactly _____ keys.

    a. K
    b. K^2
    c. $(K/2) -1$
    d. K-1

(11)

Q45. Which of the followings is TRUE for static data members?

    a.   cannot be assigned a value
    b.   can be only used in static function ✓
    c.   cannot be defined in a union
    d.   cannot be accessed outside the class

Q46. Which of the following is NOT a SDLC model?

    a.   Spiral
    b.   Prototyping
    c.   Waterfall
    d.   COCOMO ✓

Q47. Consider the following program module:

E, I, C, f, M S   *D, K, H, L, 2*

```
int Cyc_Comp (int a, int b)
{
    while (a > b) {
        if (a > b)
            a = a + b,
        else b = b - a;
    }
    return a;
}
```

What is Cyclomatic complexity of the above module?

    a. 1
    b. 4
    c. 2
    d. 3

Q48. The size of the physical address space of a processor is 2^P bytes. The word length is 2^W bytes. The capacity of cache memory is 2^N bytes. The size of each cache block is 2^M words. For a K-way set-associative cache memory, the length (in number of bits) of the tag field is

    a. $P - N - M - W + \log_2 K$
    b. $P - N + \log_2 K$ ✓
    c. $P - N - M - W - \log_2 K$
    d. $P - N - \log_2 K$

Q49. In designing a computer's cache system, the cache block (or cache line) size is an important parameter. Which one of the following statements is correct in this context?

    a. A smaller block size incurs a lower cache miss penalty ✓
    b. A smaller block size implies better spatial locality
    c. A smaller block size implies a larger cache tag and hence lower cache hit time
   d. A smaller block size implies a smaller cache tag and hence lower cache tag overhead

Q50. Which of the following statements with respect to K-segment pipelining are true?

    i) Maximum speedup that a pipeline can provide is k theoretically.

    ii) It is impossible to achieve maximum speedup k in the k-segment pipeline.

    iii) All segments in the pipeline take the same time in computation

    a. i & ii
    b. ii & iii
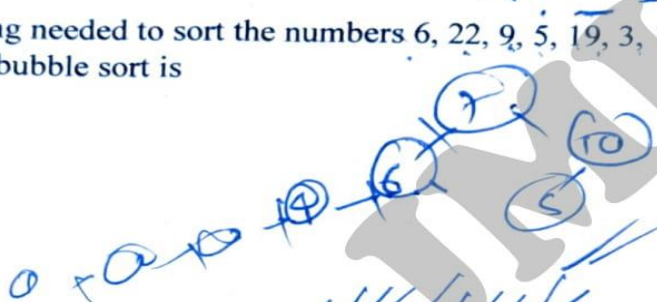   c. i & iii
    d. i, ii & iii

Q51. In which order the following numbers 10, 3, 2, 4, 6, 7, 5, 1 should be inserted in an empty binary search tree to get a binary search tree of height 5?
    a. 1,2,3,6,5,7,10,4
    b. 1,2,3,5,10,6,7,4
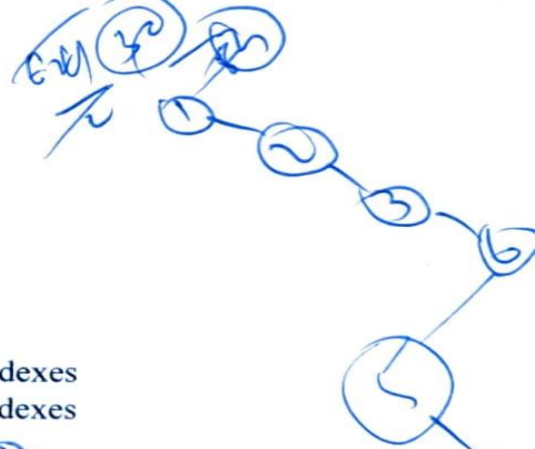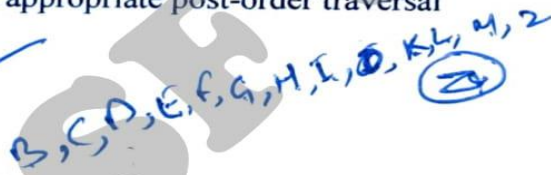   c. 1,2,3,4,6,7,10,5
    d. 1,2,3,10,4,7,6,5
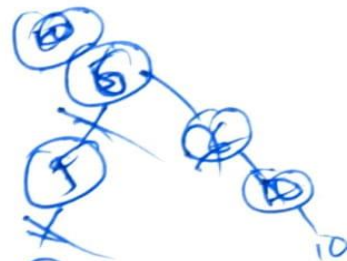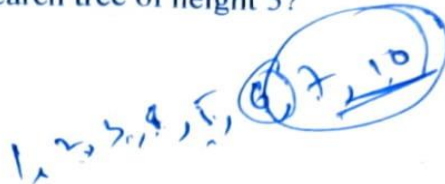
Q52. The number of swapping needed to sort the numbers 6, 22, 9, 5, 19, 3, 15, 29.in ascending order, using bubble sort is
    a. 14
    b. 12
    c. 10
    d. 15

Q53. Given the Preorder traversal of tree is **ZBCEIFMDGHKL** while its Inorder is **EICFMBGDKHLZ**. Find appropriate post-order traversal
   a. EIFMCKGLHDBZ
    b. FCGKLHDBZEIM
    c. IEMFCGKLHDBZ
    d. None of the above

**Q54.** Which of the following is correct for B+ Trees
    a. Range Queries are faster on B+ trees
    b. The height of b tree is independent of number of records
    c. B trees are for primary indexes and B+ trees are for secondary indexes
    d. B+ trees are for primary indexes and B trees are for secondary indexes

Q55. Consider the following Circuit
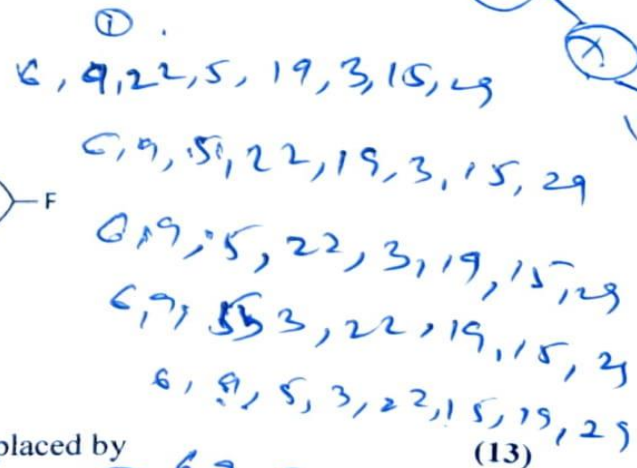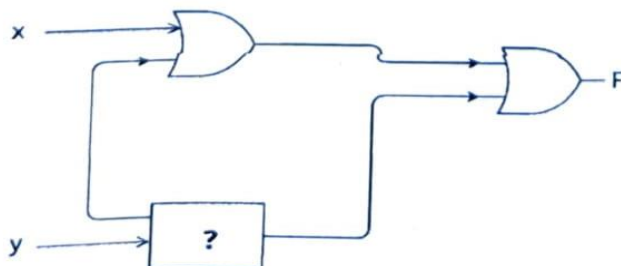
In order to make it Tautology the '?' marked box should be replaced by

    a. OR Gate

(13)
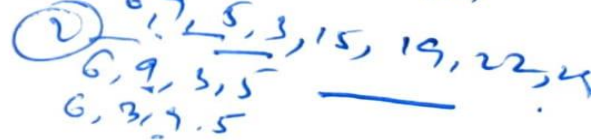
b. NOR Gate
c. NAND Gate ,
d. B and C ✓

Q56. Consider a 32-bit processor which supports 70 instructions. Each instruction is 32 bit long and has 4 fields namely opcode, two register identifiers and an immediate operand of unsigned integer type. Maximum value of the immediate operand that can be supported by the processor is 8191. How many registers the processor has?

a. 16
b. 32
c. 64 ✓
d. 128

Q57. Which of the following units can be used to measure the speed of Computer?
a. SYPS
b. MIPS
c. FLOPS
d. B and C

Q58. The address of 1057 sector is
a. <0,16,49>
b. <0,16,31> ✓
c. <0,15,31>
d. <0,15,49> ✓

Q59. Even parity used for error checking computer data. If data word to be transmitted is **1100101001101** the value of parity is?
a. 0
b. 1
c. 7 ✓
d. 6

Q60. Consider following program segment for the hypothetical CPU having three user register R1, R2, R3

Instruction	Instruction Size
MOV R1 60000	2
MOV R2, (R1)	1
ADD R2, R3	1
MOV 5000 R2	2
HALT	2

Let initial address start at 2000. What will be the value of Program Counter at HALT?

a. 2008
b. 2005
c. 2010
d. 2004 ✓

Q61. A Pentanary system is used in a computer instead of binary system. What value be the value of n bit string in binary system will occupy
   a. 5n pentanary digits
   b. 5n+2 pentanary digits
   c. $n\log_5 2$ pentanary digits
   d. $n\log_2 5$ pentanary digits

Q62. Simplify $(A+C)(AB'+AC)(AC'+B)$?
   a. AB+BC
   b. A
   c. B
   d. AC+A'B+BC'

Q63. If each element on a stack were a structure occupying ten words, the addition of eleventh word to contain a pointer
   a. Increases the space requirements by 20%
   b. Increases the space requirements by 10%
   c. decreases the space requirements by 20% ✓
   d. decreases the space requirements by 10%

Q64. An Inorder traversal is used in which tree for getting ascending order values?
   a. Binary Search Tree
   b. AVL Tree
   c. B++ Tree
   d. Linear Search Tree

Q65. A 5 stage pipeline has the stage delays are 100ns, 130ns, 160ns, 120ns, and 115ns respectively. Registers that are used between stages have a delay of 6ns. Assuming constant locking rate the total time required to process 1000 data item on this pipeline is:
   a. 120.5microsecond
   b. 164.5 5microsecond
   c. 166.65 5microsecond
   d. 825 5microsecond

Q66. The most appropriate matching the following pairs

   X. depth first search   1. Heap
   Y. Breadth first Search   2. Queue
   Z. Sorting   3. Stack

   a. X-1, Y-2, Z-3
   b. X-3, Y-1, Z-2
   c. X-3, Y-2, Z-1
   d. X-2, Y-3, Z-1

Q67. Let T be a binary search tree with 14 nodes and 60 as external path length. Then internal path length is

(15)

a. 28
b. 50
c. 32
d. 11

Q68. What would be the equivalent pointer expression for referring the array element a[i] [j] [k] [l]?

a. *(*(*(*(a +i) +j) +k) +l)
b. ((((a+i) +j) +k) +l)
c. a+i+j+k+l
d. ((((****a+i) +j) +k) +l)

Q69. Simplify the Boolean function

$$F(w,x.y,z)=\sum(0,1,2,3,7,8,10)$$

$$D(w,x,y,z) =\sum(5,6,11,15)$$

Find the sum of product

a. $w + xz + yz'$
b. $x + yz' + wx$
c. $x'z' + w'z$
d. none of the above

Q70. In a JK flip flop we have j=Q' and K=1. Assuming that flipflop was initially cleared and then clocked for 6 pulses, the sequence at the output Q will be

a. 010000
b. 011001
c. 010010
d. 010101

Q71. Which one of the following statements is false?
a. Optimal binary search tree construction can be performed efficiently using dynamic programming
b. BFS cannot be used to find connected components of graph
c. Given the prefix and Postfix walks of a binary tree, the binary tree cannot be uniquely reconstructed
d. DFS can be used to find the converted components of a graph

Q72. In a heap with n elements with the smallest element at the root , the 9th element can be found in time
a. $\Theta(nlogn)$
b. $\Theta(n)$
c. $\Theta(logn)$
d. $\Theta(1)$

Q73. The recurrence relation is $T(1) = 2$. $T(n) = 3T(n/4) + n$ has the solution T(n) equals to

a. O(n)
b. O(logn)
c. $O(n^{3/4})$
d. None of these

Q74. A hash table contains 10 buckets and uses linear probing to resolve collisions. The key values are integers and hash function used is a key %10. If the values are 54, 73, 32, 155, 175, 181 are inserted the table in what location would the key value 175 is inserted?
a. 2
b. 5
c. 6
d. 3

Q75. How many distinct binary search trees can be created out of 6 distinct keys?
a. 25
b. 36
c. 12
d. 132

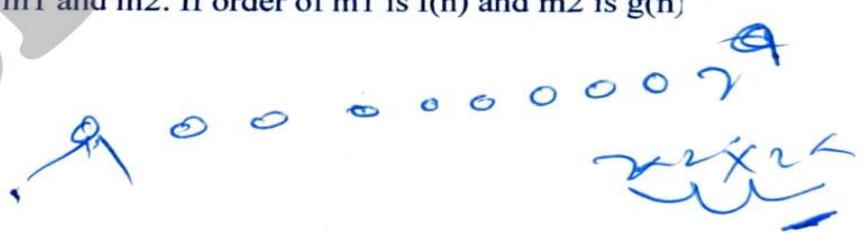**Q76.** What will be the time complexity for any typical array order?
a. O(n)
b. O(nlogn)
c. $O(n^2)$
d. O(1)

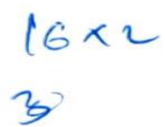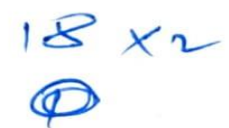**Q77.** An algorithm is made up of 2 modules m1 and m2. If order of m1 is f(n) and m2 is g(n) then order of algorithm?
a. Max(f(n), g(n))
b. min(f(n), g(n))
c. f(n)+g(n)
d. f(n)*g(n)

Q78. Maximum number of nodes at level 9 of a binary tree is?
a. 1024
b. 512
c. 18
d. 81

Q79. How many nodes splitting operations will be performed if B, I, K are inserted into the following B tree of order 4 with the help of the algorithm and insert a key in a single pass down the height of the tree? Also find the number of nodes in resulting tree?

EPX

ACD   FGH   RS   YZ

(17)
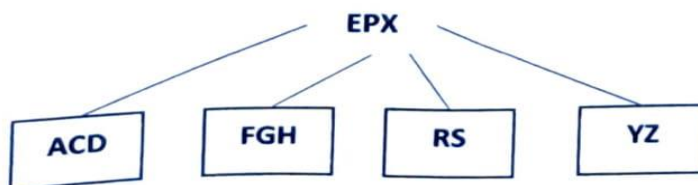
a. 4 splits, 9 Nodes
b. 4 splits, 10Nodes
c. 3 splits, 9 Nodes
d. 2 splits, 8 Nodes

Q80. Which are the nodes that violate the condition of an AVL tree in following tree?
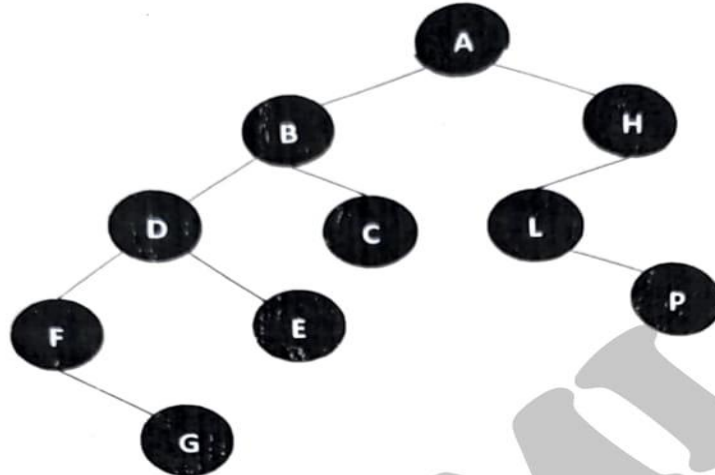
a. D,B,H,C
b. A,D,N
c. B,H
d. None of these

Q81. A master slave flip flop has characteristic that
a. Change the input immediately reflected in output
b. Change in the output occurs when the state of the slave is affected
c. Change in the output occurs when the state of master is affected
d. Both the master and slave states are affected at same time

Q82. Consider the following 'c' code assuming it runs on a byte addressed little endian machine

```
#include<iostream>
using namespace std;

int compare(int t1, int t2)
    {
        if (t1 > t2)
            return t1;
        else
            return t2;
    }
int main()
    {
        int s = 5, r = 10;
        int res;
        bool x = true;
        bool y = compare(s, r);
```
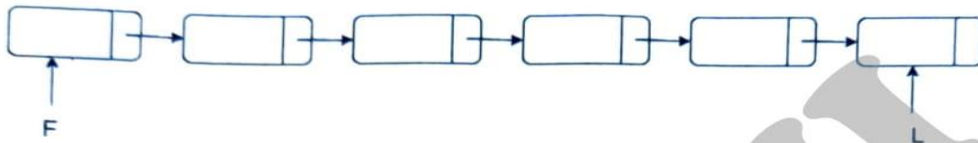
$$res = ((s + r) - (x * y));$$
$$cout << res;$$
$$return\ 0; \}$$

What is the output of the above code?

a. 62
b. 13
c. 14
d. 16

Q83. Consider a singly linked list of the form where F is a pointer to the first element in the linked list and L is the pointer to the last element in the list. The time of which of the following operations depends on the length of the list

F   L

a. Delete the first element of the list
b. Add an element after the last element of the list
c. Delete the last element of the list
d. Interchange the first two elements of the list

Q84. The following numbers are inserted into an empty binary search tree in the given order: 10, 1, 3, 5, 15, 12, 16. What is the height of the binary search tree (the height is the maximum distance of a leaf node from the root)?

a. 2
b. 3
c. 4
d. 6

Q85. Choose the equivalent prefix form of the following expression

$$(a + (b - c)) * ((d - e)/(f + g - h))$$
$$(s + (r - t)) * ((f - w)/(x + y - z))$$

a. +s − rt /− fw − + xyz
b. +s −rt − /fw − + xyz
c. +s − rt /− wf + − xyz
d. +sr − t /− wf + −xyz

Q86. What is the output of the code given below?

```
#include <stdio.h>
int main()
{
    char ch[ ]="Jamia";
    int len;
    int size;
    len = strlen(ch);
```

(19)

```
        size = sizeof(ch);
        printf("%d", len * size);
    }
```

a. 20
b. 25
c. 30
d. 40

Q87. What is the output of the following program?

```
# include <iostream>
using namespace std;
int main()
{
        char ch = 109;
        cout << ch;
        return 0;

}
```
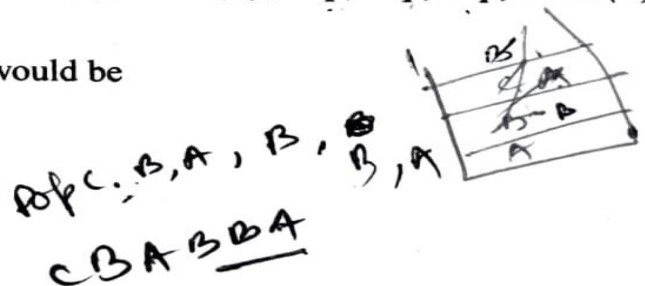
a. **m**
b. **n**
c. **o**
d. **p**

Q88. Consider the following sequence of stack operations –

Push (A), Push (B), Push(C) Pop, Push (A), Push (B), Pop, Pop, Pop, Push (B), Pop, Pop

The sequence of popped out values would be

a. C, B, A, B, B, A
b. A, B, C, A, B, B
c. C, B, A, B, A, B
d. B, C, A, A, B, B

Pop C, B, A, B, B, A

CBABBA

Q89. If a Unary operator is overloaded as a member function, how many (explicit) parameters will the member function require?

a.   None
b.   One
c.   Two ✓
d.   Unary operators can't be overloaded at all.

Q90. What is the worst case time-complexity of heap sort?

a. $\theta (n^2)$ ✓
b. $\theta (n \log n)$
c. $\theta \cdot (n)$
d. $\theta (n (\log n)^2)$

Q91. Which of the following statements is TRUE?

    a. Short-term Scheduler is never the only scheduler in a system.

    b. Short-term Scheduler selects which processes should be brought into the ready queue

    c. Mid-term Scheduler can be used to decrease the degree of multiprogramming.

    d. Long-term scheduler is invoked very frequently (in milliseconds)

Q92. Four Jobs to be executed on a single processor system arrive at time 0 in the order A, B, C and D. Their individual CPU burst time requirements are 4, 2, 8 and 2 time units respectively. The completion time of D under round robin scheduling with time slice of one time unit is

    a. 6
    b. 8
    c. 9
    d. 11

Q93. In which of the following disk block allocation methods in a file system, the insertion and deletion of blocks in a file is easy?

    a. Linked
    b. Bit-Map
    c. Contiguous
    d. Indexed

Q94. Which of the following statements is FALSE for the Critical Section Problem in process synchronisation?

    a. Critical Section is a segment of code where a Process may be changing/updating common variables.

    b. When one process in critical section, no other may be in its critical section

    c. One Critical Section code segment must be dedicated for one single common variable

    d. Each process must ask permission to enter critical section in entry section.

Q95. Which variable pair is used in classical Semaphore implementations?

    a. Release & Acquire

    b. Signal & Wait

    c. Bound & Wait

    d. Release & Signal

Q96. Which of the followings represent the Classical Dining Philosopher Problem?

a. *n* Philosophers with *n* chopsticks

b. *n-1* Philosophers with *n* chopsticks

c. *n+1* Philosophers with *n* chopsticks

d. *n* Philosophers with *n-1* chopsticks

Q97. Consider the following page reference string:

4, 2, 1, 6, 2, 1, 2, 4, 3, 7, 6, 3, 2, 1, 2, 4, 3, 7, 6

How many total page faults will occur if there are 5 frames in the system assuming that the LRU replacement strategy is being used?

a.   11

b.   13

c.   9

d.   7

Q98. In computer storage, for certain memory access patterns, the Bélády's anomaly phenomenon refers to

a. An increase in the no. of page faults even with a reduction in the no. of page frames.

b. A decline in the no. of page faults even with an increase in the no. of page frames.

c. An increase in the no. of page faults even with an increase in the no. of page frames.

d. A decline in the no. of page faults even with a reduction in the no. of page frames.

Q99. Which of the following terms refers to the very frequent occurrence of page faults & swapping

a. Crashing

b. Thrashing

c. Seizure

d. Clamping

Q100. Consider a 32-bit logical address space on a present computer where the size of a Page is 4 KB. If each entry in the table takes 4 bytes, then what shall be the size of the page table?

a. 2 MB

b. 1 MB

c. 3 MB

d. 4 MB