COMPUTER SCIENCE AND APPLICATIONS

Name & Signature of the Invigilator

PAPER-II
SEPT-18/19

OMR Answer Sheet No. :

Roll No. :

(in figures as in Hall Ticket)

Roll Number in words : ....

....

Time : 2 Hours] No. of Printed Pages : 26 **[Maximum Marks : 200**

Instructions for the Candidates ·

1. Write your Roll Number in the space provided on the top of this page.
2. This paper consists of one hundred (100) multiple choice type of questions. All questions are compulsory. ·
3. At the commencement of examination, the question booklet will be given to you. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as below :
   (i) To have access to the Question Booklet, tear off the paper seal on the edge of this cover page. Do not accept a booklet without sticker seal and do not accept an open booklet.
   (ii) Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faulty · booklets due to pages/questions missing or duplicate or not in serial order or any other discrepancy should be got replaced immediately by a correct booklet from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given.
   (iii) After this verification is over, the Test Booklet Number should be entered on the OMR Answer Sheet and the OMR Answer Sheet Number should be entered on this Test Booklet.
4. Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the oval as indicated below on the correct response against each item.

   Example : Ⓐ ● Ⓒ Ⓓ where (B) is the correct response.
5. Your responses to the items are to be indicated on the OMR Answer Sheet under Paper – II only. If you mark your response at any place other than in the oval in the OMR Answer Sheet, it will not be evaluated.
6. Read instructions given inside carefully.
7. Rough Work is to be done in the end of this booklet.
8. If you write your Name, Roll Number, Phone Number or put any mark on any part of the OMR Answer Sheet, except for the space allotted for the relevant entries, which may disclose your identity, or use abusive language or employ any other unfair means, such as change of response by scratching or using white fluid, you will render yourself liable to disqualification.
9. You have to return the original OMR Answer Sheet to the invigilator at the end of the examination compulsorily and must not carry it with you outside the Examination Hall. You are however, allowed to carry original question booklet and duplicate copy of OMR Answer Sheet on conclusion of examination.
10. Use only Blue/Black Ball point pen.
11. Use of any calculator or any electronic devices or log table etc., are prohibited.
12. There shall be no negative marking.
13. In case of any discrepancy in the English and Gujarati versions of questions, English version will be taken as final.

પરીક્ષાર્થીઓ માટે સૂચનાઓ :

1. આ પાનાની ટોચ પર દર્શાવેલી જગ્યામાં તમારો રોલ નંબર લખો.
2. આ પ્રશ્નપત્રમાં બહુવૈકલ્પિક ઉત્તરો ધરાવતા સો (૧૦૦) પ્રશ્નો આપેલા છે. બધા જ પ્રશ્નો ફરજિયાત છે.
3. પરીક્ષાની શરૂઆતમાં આપને પ્રશ્નપુસ્તિકા આપવામાં આવશે. પ્રથમ પાંચ (૫) મિનિટ દરમ્યાન તમારે પ્રશ્નપુસ્તિકા ખોલી અને ફરજિયાતપણે નીચે મુજબ પરીક્ષણ કરવું :
   (i) પ્રશ્નપુસ્તિકાનો વપરાશ કરવા માટેઆ કવર પૃષ્ઠની ધાર પર આપેલ સીલ સ્ટીકર ફાડી નાખો. કોઈપણ સંજોગોમાં સીલ સ્ટીકર વગરની કે ખુલ્લી પ્રશ્નપુસ્તિકા સ્વીકારશો નહીં.
   (ii) કવરપૃષ્ઠ પર છપાયેલ નિર્દેશાનુસાર પ્રશ્નપુસ્તિકાના પ્રશ્નો, પૃષ્ઠો અને સંખ્યાને બરાબર ચકાસી લો. ખામીયુક્ત પ્રશ્નપુસ્તિકા કે જેમાં પ્રશ્નો/પૃષ્ઠો ઓછાં હોય, બે વાર છપાયા હોય, અનુક્રમમાં અથવા અન્ય કોઈ ફરક હોય અર્થાત કોઈપણ સંજોગોમાં ખામીયુક્ત પ્રશ્નપુસ્તિકા સ્વીકારશો નહીં. અને જો ખામીયુક્ત પ્રશ્નપુસ્તિકા મળી હોય તો નિરીક્ષક પાસેથી તુરંત જ બીજી સારી પ્રશ્નપુસ્તિકા મેળવી લેવી. આ માટે ઉમેદવારને પાંચ (૫) મિનિટનો સમયગાળો આપવામાં આવશે. પછીથી, પ્રશ્નપુસ્તિકા બદલવામાં આવશે નહીં કે કોઈ વધારાનો સમયગાળો આપવામાં આવશે નહીં.
   (iii) આ ચકાસણી સમાપ્ત થાય પછી, પ્રશ્નપુસ્તિકાનો નંબર OMR જવાબ પત્રક પર લખવો અને OMR જવાબ પત્રકનો નંબર પ્રશ્નપુસ્તિકા પર લખવો.
4. પ્રત્યેક પ્રશ્ન માટે ચાર જવાબ વિકલ્પ (A), (B), (C) અને (D) આપવામાં ઓવલ છે. તમારે સાચા જવાબના ઓવલ (oval) ને નીચે આપેલ ઉદાહરણ મુજબ પેનથી ભરીને સંપૂર્ણ કાળું કરવાનું રહેશે.

   ઉદાહરણ : Ⓐ ● Ⓒ Ⓓ કે જ્યાં (B) સાચો જવાબ છે.
5. આ પ્રશ્નપુસ્તિકાના પ્રશ્નો ના જવાબ અલગથી આપવામાં આવેલ OMR જવાબ પત્રકમાં પેપર–II લખેલ વિભાગમાં જ અંકિત કરવા. જો આપ OMR જવાબ પત્રકમાં આપેલ ઓવલ (oval) સિવાય અન્ય સ્થાને જવાબ અંકિત કરશો તો જવાબનું મૂલ્યાંકન કરવામાં આવશે નહીં.
6. અંદર આપેલ સૂચનાઓ ધ્યાનપૂર્વક વાંચો.
7. કાચું કામ (Rough Work) પ્રશ્નપુસ્તિકાના અન્તિમ પૃષ્ઠ પર કરવું.
8. જો આપ OMR જવાબ પત્રક નિયત જગ્યા સિવાય અન્ય કોઈપણ સ્થાને, આપનું નામ, રોલ નંબર, ફોન નંબર અથવા એવું કોઈ ચિહ્ન કે જેનાથી તમારી ઓળખ થઈ શકે, અંકિત કરશો અથવા અભદ્ર ભાષાનો પ્રયોગ કરો, અથવા અન્ય કોઈ અનુચિત સાધનોનો ઉપયોગ કરો, જેમ કે અંકિત કરી દીધેલ જવાબ ભૂંસી નાખવો કે સફેદ શાહીનો ઉપયોગ કરી બદલશો તો આપને પરીક્ષા માટે અયોગ્ય જાહેર થઈ શકો છો.
9. પરીક્ષા સમય પૂરો થઈ ગયા બાદ ઓરીજીનલ OMR જવાબ પત્રક જે તે નિરીક્ષકને ફરજિયાત સોંપી દેવું અને કોઈ પણ સંજોગોમાં તે પરીક્ષાખંડની બહાર લઈ જવું નહીં. પરીક્ષા પૂર્ણ થયા બાદ ઉમેદવાર ઓરીજીનલ પ્રશ્નપુસ્તિકા અને OMR જવાબ પત્રકની ડુપ્લિકેટ કોપી પોતાની સાથે લઈ જઈ શકે છો.
10. માત્ર કાળી/ભૂરી બોલ પોઈન્ટ પેન વાપરવી.
11. કેલ્ક્યુલેટર, લોગ ટેબલ અને અન્ય ઈલેક્ટ્રોનિક યંત્રોનો ઉપયોગ કરવાની મનાઈ છે.
12. ખોટા જવાબ માટે નકારાત્મક ગુણાંકન પ્રથા નથી.
13. પ્રશ્નપુસ્તિકાના કોઈ પ્રશ્નમાં અનુવાદ અંગે કોઈ વિવાદ/મતભેદ જણાય તો અંગ્રેજી વર્ઝન યોગ્ય ગણાશે.

COMPUTER SCIENCE AND APPLICATIONS
PAPER-II

Note : This paper contains **One Hundred (100)** multiple-choice, matching questions, each question carrying **TWO (2)** marks. Attempt **All** the questions.

1. In a college of 500 students, what is the probability that *at least two* students have the same birthday ?

   (A) 0

   (B) 1

   (C) $\frac{1}{2}$

   (D) $\frac{1}{366}$

2. What is the minimum height possible for a binary tree of 17 vertices ?

   (A) 2

   (B) 3

   (C) 4

   (D) 5

3. Which of the following is *true* ?

   (A) Every Eulerian graph is Hamiltonian

   (B) Every Hamiltonian graph is Eulerian

   (C) It is easy to find whether a graph is Eulerian

   (D) It is easy to find whether a graph is Hamiltonian

4. Which of the following is *false* ?

   (A) For every NFA, there is a DFA that accepts the same language

   (B) For every NPDA, there is a DPDA that accepts the same language

   (C) For every NDTM, there is a DTM that accepts the same language

   (D) The union of CFGs is a CFG

5. If P and Q are propositional variables, identify which of the following assertions is a tautology.

(A) $P \Rightarrow Q$

(B) $(P \vee Q) \Rightarrow Q$

(C) $P \Rightarrow (P \wedge Q)$

(D) $P \Rightarrow (P \vee Q)$

6. In the standard notation of predicate logic, which of the following assertions is valid for any universe and any interpretation of predicates $P(x)$ and $Q(x)$?

(A) $\exists x [P(x) \Rightarrow Q(x)] \Leftrightarrow \forall x [P(x) \Rightarrow Q(x)]$

(B) $\exists x [P(x) \Rightarrow Q(x)] \Leftrightarrow [\forall x P(x) \Rightarrow \exists x Q(x)]$

(C) $\exists x [P(x) \Rightarrow Q(x)] \Leftrightarrow [\exists x P(x) \Rightarrow \exists x Q(x)]$

(D) $\exists x [P(x) \Rightarrow Q(x)] \Leftrightarrow [\exists x P(x) \Rightarrow \forall x Q(x)]$

7. Assume that you are representing 4-bit signed integers using the 2's complement convention. Which of the following binary words denote the value –5 ?

(A) 1001

(B) 1100

(C) 1011

(D) 1010

8. Consider a boolean function of three variables which has the value 1 only when there are an odd number of 1's in the inputs. What is the number of minterms in the sum of products form of the function obtained from its truth table ?

(A) 3

(B) 4

(C) 5

(D) 6

9. Given the C function as defined below :

int fn(int v)

{

    if (v==1 || v==0)

        return 1;

    if (v%2==0)

        return fn(v/2)+2;

    else

        return fn(v−1)+3;

}

determine the value of fn(7)

(A) 10   (B) 11

(C) 1   (D) 12

10. Consider the following C program :

main()

{

    int a[5]={5, 1, 2, 3, 4}, *p=a, *q=a+3, i;

    p=*p;

    q%=(a+2);

    for (i=0; i<1; 1++)

        printf ("\n%d %d", p[i], q[−i]);

}

Specify the output of the program.

(A) 25 1   (B) 25 0

(C) 25 2   (D) syntax error

11. In C++, if a class C is derived from class B, which is derived from class A, all through public inheritance, then a class C member function can access.

   (A) Protected and public data only in C and B

   (B) Protected and public data only in C

   (C) Private data in A and B

   (D) Protected data in A and B

12. If class A is friend of class B and if class B is friend of class C, which of the following is *true* ?

   (A) Class C is friend of class A

   (B) Class A is friend of class C

   (C) Class A and class C do not have any friend relationship

   (D) Class C is friend of both class A and class B

13. The 4th Normal Form deals with :

   (A) Full functional dependency

   (B) Transitive dependency

   (C) Multi-valued dependency

   (D) Pseudo-transitive dependency

14. Consider the functional dependency set :

   $F = ABC \rightarrow D, B \rightarrow E, E \rightarrow A.$

   Identify the *correct* statement.

   (A) A can be dropped from F

   (B) B can be dropped from F

   (C) C can be dropped from F

   (D) D can be dropped from F

15. Consider the following relational schema,

`Employee(eid, ename, salary, address, dno), Dependent(eid, dependentname, relation)`

then what does the following SQL query retrieve ?

`SELECT eid FROM Employee MINUS SELECT eid FROM Dependent`

    (A) Employees who do not have dependents

    (B) Dependents who are not employees

    (C) Employees who have dependents

    (D) Dependents who are employees

16. A unique index is automatically *not* created on :

    (A) Candidate key   (B) Primary key

    (C) Unique key   (D) Foreign key

17. Given pointer to a node X in a singly linked list. Only one pointer is given, pointer to head node is not given, can we delete the node X from given linked list ?

    (A) Possible if X is not last node

    (B) Possible if size of linked list is known

    (C) Possible if X is not first node

    (D) Not possible

18. A complete binary min-heap is made by including each integer in [1....1023] exactly once. The depth of a node in the heap is the length of the path from the root of the heap to that node. Thus, the root is at depth 0. The maximum depth at which integer 9 can appear is :

    (A) 4   (B) 5

    (C) 6   (D) 8

19. The smallest number of keys that will force a B-tree of order 3 to have a height 3 is :

   (A) 18   (B) 15

   (C) 8   (D) 7

20. Suppose we are implementing quadratic probing with a hash function Hash (X) = X mod 100. If an element with key 4594 is inserted and the first three locations attempted are already occupied, then the next cell that will be tried is :

   (A) 2   (B) 3

   (C) 9   (D) 97

21. Bandwidth signifies which of the following ?

   (A) Class of IP used in Network

   (B) Transmission capacity of a communication channel

   (C) Total number of computers in the Network

   (D) Width of the Network

22. Which of the following system calls result in the sending of the SYN packets ?

   (A) Socket   (B) Bind

   (C) Listen   (D) Connect

23. If a class B network on the internet has a subnet mask of 255.255.248.0, what is the maximum number of hosts per subnet ?

   (A) 1022   (B) 1023

   (C) 2046   (D) 2047

24. Which of the following uses UDP as a transport protocol ?

(A) HTTP (B) Telnet

(C) DNS (D) SMTP

25. A macro processor for assembly language may *not* be implemented using :

(A) Independent one-pass assembler

(B) Independent two-pass assembler

(C) Processor incorporated into pass 1 of a standard two pass assembler

(D) Any one-pass assembler

26. The program that is *not* used as utility from the following is :

(A) spooler (B) debugger

(C) editor (D) interpreter

27. Which statement is *correct* for a parse tree of a string w belonging to L(G), where G is unambiguous grammar ?

(A) There exists exactly one left-most order of derivation and one equivalent right-most order of derivation for every w in L(G).

(B) There exist more than one left-most order of derivation but may not be any equivalent right-most order of derivation for every w in L(G)

(C) There may be more than one parse tree for w belonging to L(G)

(D) There exist one left-most order of derivation but may have more than one equivalent right-most order of derivation for every w in L(G)

28. A sequence of statements of the form x = y op z is used :

    (A) In Quadruple representation

    (B) Only in Triple representation

    (C) Only in Indirect Triple representation

    (D) Only in Indirect Quadruple representation

29. Which one is a high level abstraction over semaphore ?

    (A) Mutual Exclusion   (B) Shared Memory

    (C) Messaging   (D) Monitor

30. Which memory allocation scheme from the following suffers from external fragmentation ?

    (A) Paging   (B) Demand Paging

    (C) Segmentation   (D) Both (A) and (C)

31. Assume four processes – P1, P2, P3 and P4 – with burst time of 6, 8, 7 and 3 milliseconds respectively. If process is scheduled with SJF algorithm, then which process has waiting time of 0 milliseconds ?

    (A) P1   (B) P2

    (C) P3   (D) P4

32. Unix command to display *File copied successfully* if copy command executed successfully otherwise to display *File is not copied* is :

    (A) cp x y || echo File copied successfully && echo File is not copied

    (B) cp x y && echo File copied successfully || echo File is not copied

    (C) cp x y ; echo File copied successfully ; echo File is not copied

    (D) cp x y & echo File copied successfully | echo File is not copied

33. Which are the essential elements of project management ?

I. People II. Process III. Product IV. Project

(A) II and III

(B) I, II and III

(C) III and IV

(D) I, II, III, IV

34. Which tool is used for structure analysis ?

(A) UML

(B) DFD

(C) Warrior-Orr diagram

(D) HIPO diagram

35. Test stubs and test drivers are :

(A) Tested modules

(B) Dummy modules

(C) Executable modules

(D) Non-executable modules

36. Which model reduces the cost of development of a software ?

(A) Waterfall

(B) Prototyping

(C) Iterative

(D) Non-iterative

37. If the carried load for component is 3000 Erlang at 5% Blocking, what is the offered load ?

(A) 3158 Erlang

(B) 3005 Erlang

(C) 3020 Erlang

(D) 3200 Erlang

38. Which of the following is *not* a similarity between XML and HTML ?

(A) Both use tags to structure documents

(B) Both are used to display data to end user with the help of a browser

(C) Both are used to exchange data between applications

(A) Only C

(B) A and B

(C) B and C

(D) A and C

39. A data warehouse that is limited in scope and whose data are obtained by selecting and summarizing data from the enterprise data warehouse best describes a(n) :

   (A) Information desk   (B) Rule base

   (C) Data mart   (D) Data center

40. Data mining is used to aid in :

   (A) Operational data management

   (B) Analyzing past decision made by managers

   (C) Detecting patterns in operational data

   (D) Retrieving archival data

41. What is the boolean function $f(P, Q, R)$ that is implemented by the following gate network ?
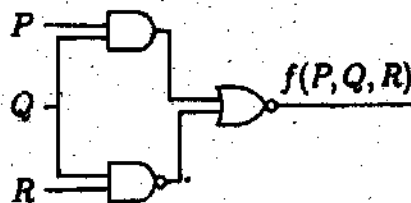
   (A) $\bar{P}QR$ (B) $P\bar{Q}R$

   (C) $PQ\bar{R}$ (D) PQR

42. Regarding the number of inputs and outputs of a multiplexer, which of the following is *correct* ?

   (A) More outputs, less inputs

   (B) More inputs, less outputs

   (C) Equal number of inputs and outputs

   (D) Any number of inputs and outputs

43. For inputs P and Q of a NOR latch, which of the following states is prohibited ?

   (A) P and Q both high

   (B) P and Q both low

   (C) P low and Q high

   (D) P high and Q low

44. In a microprocessor, the identification of the current stage of execution of an instruction depends on the contents of a ring counter. How many different states can be identified by a 6-bit ring counter ?

   (A) 6

   (B) 2^6

   (C) 6!

   (D) 2^6-1

45. The Canonical Cover for a set of functional dependencies expresses :

   (A) All possible functional dependencies

   (B) Minimal functional dependencies

   (C) Derived functional dependencies

   (D) All transitive functional dependencies

46. Which of the following commands would generate implicit locking of tuples :

   (A) CREATE

   (B) COMMIT

   (C) UPDATE

   (D) GRANT

47. Concurrency control for replicated data is handled similar to unreplicated data in which of the following distributed concurrency control protocol ?

   (A) Primary Copy

   (B) Majority Protocol

   (C) Tree Protocol

   (D) Validation based Protocol

48. The total numbers of projections possible on a relation of degree n would be :

   (A) n^2

   (B) $2n$

   (C) $n-1$

   (D) 2^n-1

49. If we plot a line with endpoints (20,10) and (30,18) using Bresenham Line Drawing Algorithm, the last five coordinates of the line on x-axis are :

(A) (26, 15), (27,16), (28, 16), (29,17) and (30,18)

(B) (26, 14), (27,15), (28, 16), (29,17) and (30,18)

(C) (26,15), (27,15), (28, 16), (29,17) and (30,18)

(D) (26, 15), (27,16), (28, 17), (29,17) and (30,18)

50. How can you represent infinity in 3D by using homogenous coordinates ?

(A) Set final (w) coordinate to 0

(B) Set final (w) coordinate to infinity

(C) Set z coordinate to 0

(D) Not possible

51. Consider a raster system with the resolution of 1024×768 pixels and capable of displaying 24-bit color images. What is the minimum amount of video RAM in K-bytes that the computer must have to support the above-mentioned resolution and number of colors ?

(A) 2400   (B) 2304

(C) 1024   (D) 2048

52. CMYK models are used for :

(A) Computer display   (B) Computer printing

(C) Video games   (D) None of these

53. argv is a/an :

(A) Array of character pointers

(B) Pointer to an array of character pointers

(C) Array of strings

(D) Array of string pointers

54. In which of the following parameter passing mechanism, the actual argument to be a variable ?

    (A) Pass by result   (B) Pass by value

    (C) Pass by reference   (D) Both (A) and (B)

55. The regular expression $(a + b)^*$ bba denotes :

    (A) All possible combinations of a's and b's

    (B) Set of all strings ending with bba

    (C) Set of all strings starting with b and ending with bba

    (D) Set of all strings starting with a and ending with ba

56. The advantage of using parser with valid prefix property is that :

    (A) It detects an error where it has actually occurred

    (B) It reports an error as possible

    (C) It detects an error much earlier than its occurrence

    (D) It repairs all possible errors.

57. Piggy backing is a method of :

    (A) Backtracking

    (B) Forwarding

    (C) Methods to combine a data frame and ACK

    (D) Methods to separate a data frame

58. How many characters per second (7 bits+1 parity) can be transmitted over a 3200 bps line in case of synchronous and asynchronous transfer (1 stop and 1 start bit)?

   (A) 400, 400   (B) 400, 320

   (C) 320, 320   (D) 320, 400

59. Which of the following devices translates between dissimilar network protocols ?

   (A) Router   (B) Repeater

   (C) Switch   (D) Gateway

60. In Selective Repeat, ARQ window size of sender and receiver must be :

   (A) 2^n (B) $2^n/3$

   (C) $2^n/2$ (D) 1

61. Let A be a two-dimensional array declared as follows :

   A : array [1.......10] [1........15] of char;

   Assuming that each char takes one memory location the array is stored in row major order and the first element of the array is stored at location 100, what is the address of element A[i][j] ?

   (A) $15i + j + 84$ (B) $15j + i + 84$

   (C) $10i + j + 89$ (D) $10j + i + 89$

62. If a complete binary search tree contains 15 integer numbers, what will be the maximum number of comparisons performed to search for a number in the tree?

   (A) 8   (B) 14

   (C) 5   (D) 4

63. From fastest to slowest, the correct order for the following algorithms is :

(A) Linear search, Binary search, Bubble sort, Heap sort, Finding the maximum element of an unsorted array, Finding the maximum element of a sorted array.'

(B) Finding the maximum element of an unsorted array, Finding the maximum element of a sorted array, Linear search, Binary search, Heap sort, Bubble sort.

(C) Finding the maximum element of a sorted array, Binary search, Linear search, Finding the maximum element of an unsorted array, Heap sort, Bubble sort.

(D) Bubble sort, Heap sort, Binary search, Linear search, Finding the maximum element of a sorted array, Finding the maximum element of an unsorted array.

64. An algorithm that always takes the best immediate or local solution while finding the solution is called :

(A) Divide and Conquer Algorithm (B) Local Algorithm

(C) Greedy Algorithm (D) Dynamic Programming

65. Suppose you have written a Java program MyJavaProgram and compiled it and ran it. In default file naming convention, which of the following files is interpreted by the JVM ?

(A) MyJavaProgram.java (B) MyJavaProgram.exe

(C) MyJavaProgram.class (D) MyJavaProgram.com

66. In C++ and Java, which of the following features is *not* essential for polymorphic behaviour of programs ?

   (A) Inheritance   (B) Method overriding

   (C) Method overloading   (D) Encapsulation

67. Which of the following HTML tags is not essential for a valid HTML document ?

   (A) *<title>*   (B) *<html>*

   (C) *<body>*   (D) *<source>*

68. Which of the following is a java servlet container ?

   (A) Apache   (B) Tomcat

   (C) IIS   (D) Oracle

69. A risk analysis activity is a major activity associated with :

   (A) Waterfall model   (B) Prototyping model

   (C) Spiral model   (D) Both (B) and (C)

70. Modularity in software design pertains to :

   (A) Aggregation of components   (B) Consistency in components

   (C) Partitioning of components (D) Both (A) and (B)

71. Which one of the following is *not* an attribute of code quality ?

   (A) Complexity   (B) Component completeness

   (C) Maintainability   (D) Understandability

72. Which testing is used to reset the whole software after modification has been made ?

    (A) Acceptance testing   (B) Regression testing

    (C) Unit testing   (D) Integration testing

73. What are Daemons in Unix for :

    (A) Run permanently and handle tasks like updating log files, managing network connections etc.

    (B) Are invoked once to initialize and configure some aspect of the operating system.

    (C) Provide the standard C library for programming

    (D) Both (B) and (C)

74. The Dining–Philosophers problem will occur in case of :

    (A) 5 philosophers and 5 chopsticks

    (B) 6 philosophers and 5 chopsticks

    (C) 3 philosophers and 5 chopsticks

    (D) 4 philosophers and 5 chopsticks

75. The average time required to reach a storage location in memory and obtain its contents is called the :

    (A) Turnaround time   (B) Seek time

    (C) Throughput   (D) Access time

76. Which one is more important while accessing data on the disk ?

   (A) Turnaround time   (B) Seek time

   (C) Rotational time   (D) Granularity

77. Cut in PROLOG is a :

   (A) Goal that always fails

   (B) Representation of procedural knowledge

   (C) Shell

   (D) Goal that always succeeds

78. Which *one* of the following is *true* when exactly two of P, Q or R are true ?

   (A) $(P \wedge \bar{Q} \wedge R) \vee (P \wedge \bar{Q} \wedge \bar{R}) \wedge (\bar{P} \wedge Q \wedge \bar{R})$

   (B) $(P \vee Q \vee R) \wedge (P \vee \bar{Q} \vee R) \wedge (P \vee Q \vee \bar{R})$

   (C) $(P \wedge Q \wedge R) \vee (P \wedge \bar{Q} \wedge R) \vee (P \wedge Q \wedge \bar{R})$

   (D) $(P \wedge \bar{Q} \wedge R) \wedge (P \wedge \bar{Q} \wedge \bar{R}) \vee (\bar{P} \wedge Q \wedge \bar{R})$

79. The decision-making environment of an executive level manager can be characterized as :

   (A) Structured   (B) Semistructured

   (C) Unstructured   (D) Both (B) and (C)

80. An Expert system contains :

   (A) Declarative knowledge   (B) Procedural knowledge

   (C) Heuristic knowledge   (D) Analytical knowledge

81. A Finite State Machine can recognize :

    (A) Any grammar

    (B) Only context sensitive grammar

    (C) Only context free grammar

    (D) Only regular grammar

82. How many of the following languages are context free ?

    (1) $L = \{a^i b^j c^k \mid i,j,k >= 0$ and either $i = j$ or $j = k\}$

    (2) $L = \{w \mid w$ consists of all strings made up of a's and b's and number of a's is more than number of b's$\}$

    (3) $L = \{0^n 1^n \mid n > 0\} \cup \{0^n 1^{2n} \mid n > 0\}$.

    (4) $L = \{w \mid w$ consists of all strings made up of a's and b's that start and end with the same symbol$\}$

    (A) 1   (B) 2

    (C) 3   (D) 4

83. How many of the following statements are *true* ?

    (1) Let $L' = L1 \cap L2$. If L' is regular and L1 is regular, L2 must be regular.

    (2) Every subset of a regular language is regular

    (3) The language $L = \{x \in \{a, b\}^* : x$ contains exactly two more b's than a's $\}$ is not regular.

    (4) If L1 and L2 are not regular languages, then $L1 \cup L2$ is not regular.

    (A) 1   (B) 2

    (C) 3   (D) 4

84. Context Sensitive Grammar is :

(A) Type 1 Grammar   (B) Type 2 Grammar

·(C) Type 3 Grammar   (D) Type 4 Grammar

85. An alphabet consists of the letters A, B, C and D. The probability of occurrence is $P(A) = 0.4$, $P(B) = 0.1$, $P(C) = 0.2$ and $P(D) = 0.3$. The Huffman code assigns :

(A) One bit to letter A and two bits to letter D

(B) Two bits to letter A and three bits to letter D

(C) One bit to letter A and three bits to letter D

(D) Two bits to letter A and four bits to letter D

86. Which of the following are the properties of Fourier Transform ?

(a) Spatial Frequencies

(b) Separability

(c) Uniqueness

(d) Convolution

(e) Innerproduct Preservation

(A) a, b (B) d, c, e

(C) a, c, d (D) a, b, c, d, e

87. Which of the following is *not* a JPEG Encoder block ?

(A) Forward Discrete Cosine Transform

(B) Maximizer

(C) Quantizer

(D) Entropy Encoder

88. The best visual compression quality is achieved using :

(A) Fourier

(B) DCT

(C) Wavelets

(D) Dolby

89. Which one of the following is *wrong* ?

(A) A bounded convex polyhedron is known as a convex polytope.

(B) The intersection of any number of convex sets is also convex.

(C) The local minimum solution is global for a linear programming problem

(D) Transportation problem is NLPP

90. The type of situation in solving LPP when there is a tie in outgoing variables is known as :

(A) Consistency

(B) Degeneracy

(C) Inconsistency

(D) Unbalanced

91. What is *not true* about assignment and transportation problems ?

(A) Both are special types of LPP

(B) Relationship between variables and constraints are linear

(C) Coefficients of variables in the solution will be either 0 or 1

(D) Both are basically maximization problems

92. Consider the following LPP :

Max $2x1 + 3x2$

s.t

$$4x1 + 6x2 \leq 12, x1 + x2 \geq 1, x1 - 2x2 \leq 2; x1, x2 \geq 0$$

It has

(A) No feasible solution

(B) Unique optimum solution

(C) Exactly two optimum solutions

(D) Infinitely many optimum solutions

93. Which of the following boolean functions or operators cannot be represented by a single layer neural network ?

(A) NOR

(B) XNOR

(C) NAND

(D) OR

94. Consider the following artificial neuron with two inputs x_1 and x_2 and a bias input tied to -1. Determine the boolean function represented by the neuron with the given weights for unit thresholding (*signum*) activation function .
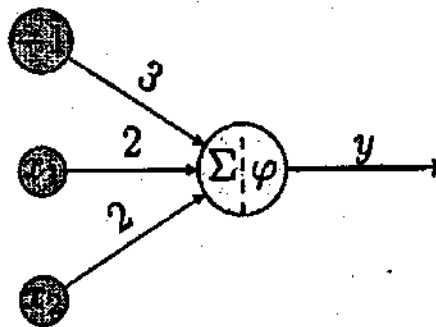
(A) OR

(B) AND

(C) NOR

(D) NAND

95. If A and B are two Fuzzy sets with membership functions A(x) and B(x) defined for any real number x, then membership function for the set of elements in A but not in B is given by :

(A) Maximum {A(x), B(x)}

(B) Minimum {A(x), 1 – B(x)}

(C) Maximum {A(x), 1– B(x)}

(D) Minimum {1–A(x), B(x)}

96. Let X be a universal set and P(X) be its power set. Let g be a Fuzzy measure and *Bel* be a Belief measure on (X, P(X)). Consider the assertions :

S1 : $g(A \cap B) \le Min\{g(A), g(B)\}$ and S2 : $Bel(A) + Bel(A^c) \le 1$

Then :

(A) Both S1 and S2 are False

(B) S1 is False but S2 is True

(C) S1 is True but S2 is False

(D) Both S1 and S2 are True

97. Which Class is used to handle the Windows Message and Control information ?

(A) CView

(B) CMDIFrameWnd

(C) CFrameWnd

(D) CWnd

98. Which command is used to create a symolic link in Unix ?

(A) ln

(B) ls

(C) id

(D) vi

99. Result of conditions 5 – eq 05 and 5 = 05 in Unix shell programming will be respectively :

(A) True and True

(B) True and False

(C) False and True

(D) False and False

100. Windows XP uses :

(A) Priority-based Non-Preemptive scheduling algorithm

(B) Priority-based Preemptive scheduling algorithm

(C) Round Robin scheduling.

(D) Both (A) and (C)