Signature of Invigilators

1. .....

2. .....

Roll No. | | | | | |

(In figures as in Admit Card)

COMPUTER SCIENCE AND APPLICATION

Paper II

Roll No. .....

.....

(In words)

J—1902

Name of the Areas/Section (if any) .....

Time Allowed : 75 Minutes] [Maximum Marks : 100

Instructions for the Candidates

1. Write your Roll Number in the space provided on the top of this page.
2. This paper consists of *fifty* **(50)** multiple choice type questions. *All* questions are compulsory.
3. Each item has upto four alternative responses marked (A), (B), (C) and (D). The answer should be a capital letter for the selected option. The answer letter A question should entirely be contained within the corresponding square.

   Correct method [A] Wrong Method [A] or [A]
4. Your responses to the items for this paper are to be indicated on the ICR Answer Sheet under paper II only
5. Read instructions given inside carefully.
6. One sheet is attached at the end of the booklet for rough work.
7. You should return the test booklet to the invigilator at the end of paper and should not carry any paper with you outside the examination hall.

પરીક્ષાર્થીઓ માટેની સૂચનાઓ :

૧. આ પાનાની ટોચમાં દર્શાવેલી જગ્યામાં તમારો રોલ નંબર લખો.

૨. આ પ્રશ્નપત્રમાં કુલ **પચાસ (50)** બહુવિકલ્પીય ઉત્તરો ધરાવતા પ્રશ્નો આપેલા છે. **સભી** પ્રશ્ન અનિવાર્ય છે.

૩. પ્રત્યેક પ્રશ્ન વધૂમાં વધૂ ચાર બહુવૈકલ્પિક ઉત્તરો ધરાવે છે. જે (A), (B), (C) અને (D) વડે દર્શાવવામાં આવ્યા છે. પ્રશ્નનો ઉત્તર કેપીટલ સંજ્ઞા વડે આપવાનો રહેશે. ઉત્તરની સંજ્ઞા આપેલ ખાનામાં બરાબર સમાઈ જાય તે રીતે લખવાની રહેશે.

   ખરી રીત : [A] ખોટી રીત : [A] , [A]

૪. આ પ્રશ્નપત્રના જવાબ આપેલ ICR Answer Sheet ના Paper II વિભાગની નીચે આપેલ ખાનાઓમાં આપવાના રહેશે.

૫. અંદર આપેલ સૂચનાઓ કાળજીપૂર્વક વાંચો.

૬. આ બુકલેટની પાછળ આપેલું પાનું/રફ કામ માટે છે.

૭. પરીક્ષા સમય પૂરો થઈ ગયા પછી આ બુકલેટ જે તે નીરીક્ષકને સોંપી દેવી. કોઈપણ પેપર પરીક્ષા રૂમની બહાર લઈ જવું નહી.

SEAL

COMPUTER SCIENCE AND APPLICATIONS

PAPER II

Note :—This paper contains *fifty* (**50**) multiple choice questions, each question carrying *two* (**2**) marks each. Attempt *all* of them.

1. Let X = {a, b} be a set of two elements. The number of different binary operations that can be defined on X are :

   (A) 2 (B) 2^2 (C) 2^3 (D) 2^4

2. The algebraic system $< X, +, * >$ with X = {0, 1, 2, 3, 4, 5} and +, * on X defined as :

   For a, b $\in$ X, $a * b = (a \cdot b) \bmod 6$

   $a + b = (a + b) \bmod 6$

   is a :

   (I) group under *

   (II) group under +

   (III) ring

   (IV) field

   (A) Only (I) and (II) are true

   (B) Only (II) and (III) are true

   (C) Only (III) and (IV) are true

   (D) Only (II) and (IV) are true

3. How many nodes are there in a complete binary tree of level 4 ?

   (A) 7 (B) 8 (C) 9 (D) 15

4. The statements :

   (1) K_5 is a planar graph

   (2) $K_{3,3}$ is a planar graph

   (A) Both are false (B) Both are true

   (C) (1) is true but (2) is false (D) (2) is true but (1) is false

5. The grammar

$G = \langle \{S\}, \{0, 1\}, P, S \rangle$

where $P = \{S \rightarrow 0S1,\ S \rightarrow 0S,\ S \rightarrow S1,\ S \rightarrow 0\}$

will generate :

(A) Context free language

(B) Context sensitive language

(C) Regular langauge

(D) Recursively enumerable language

6. Conversion of decimal number 119 to octal gives :

(A) 145 (B) 156 (C) 167 (D) 178

7. A boolean expression with truth table as :

a	b	c	f (a, b, c)
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1

in simplified form is :

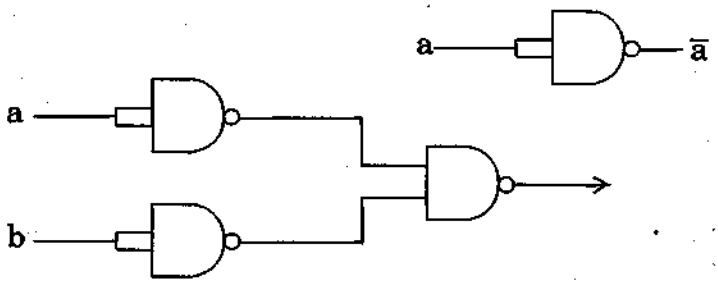
(A) $a + \bar{a}\bar{b}c$

(B) $\bar{a}\bar{b}c$

(C) $a + abc$

(D) $\bar{a}\bar{b}\bar{c} + abc$

8. The function represented by the following circuit is :



(A) $a \cdot b$ (B) $a + b$ (C) $\bar{a} \cdot \bar{b}$ (D) $\bar{a} + \bar{b}$

9. A synchronous communication line uses byte oriented protocol where the size of each frame is equal to 100 characters (including control bytes). If the bit error probability is 10^{-3} and each character is 4 bits long without parity bit, the probability that the frame will arrive with one or more bit errors is equal to :

(A) $(.999)^{100}$ (B) $(.001)^{400}$

(C) $1 - (.999)^{100}$ (D) $1 - (.999)^{400}$

10. How many Boolean functions of 3 variables are there ?

(A) 8 (B) 64 (C) 128 (D) 256

11. A static function :

(A) should be called when an object is destroyed

(B) is closely connected with the individual object of a class

(C) can be called using class name and function name

(D) is used when a dummy object is created

12. A friend function can be used to :

(A) Avoid argument between the classes

(B) Allow access to the classes whose source code is not available

(C) Increase versatility of an overload function

(D) None of the above

13. The new operator :

(A) Defines a new operator

(B) Creates a variable called new

(C) Obtain memory for a new variable

(D) None of the above

14. Which of the following is a storage type declaration that let the variable to be stored on the stack ?

(A) Static (B) Automatic

(C) External (D) Static auto

15. Assume a class Derv that is privately derived from a class Base. An object of the class Derv located in the main ( ) can access :

(A) Public members of Derv (B) Protected members of Base

(C) Private members of Derv (D) Public members of Base

16. Study the following Set A and Set B :

Set A	Set B
(a1) Conceptual schema	(b1) Analysis and logical design phase
(a2) External schema	(b2) Physical design phase
(a3) Internal schema	(b3) Analysis phase

Find out the most correct match from the following :

(A) a1–b3; a2–b1; a3–b2 (B) a1–b1; a2–b2; a3–b3

(C) a1–b1; a2–b3; a3–b2 (D) a1–b2; a2–b1; a3–b3

17. Pick up the *incorrect* statement from the following :

(A) The EER notation allows to capture the important business rules that apply to supertype/subtype relationships

(B) The use of domain constraints improves productivity and helps to improve the quality of data definitions

(C) The most active area of business rules development is in the area of operational constraints

(D) None of the above

18. Pick up the incorrect statement from the following model supports aggregation :

(A) The object oriented model supports aggregation

(B) UML provides several keywords that can be used as constraints on classes, attributes, relationships, etc.

(C) Logical database design is the process of transforming the logical data model with a conceptual data model

(D) None of the above

19. RAID stands for :

(A) Redundant Arrays of Inexpensive Disks

(B) Reduced Arrays of Inexpensive Disks

(C) Reduced Access of Inexpensive Disks

(D) Redundant Access of Inexpensive Disks

20. Pick up the *incorrect* statement from the following :

(A) QBE provides a visual programming environment used for the development of queries

(B) OLE provides interoperability among software components and applications

(C) Attaching database to the web requires HTML forms

(D) None of the above

21. How many values can be held by three arrays A, B and C with dimensions A [0 . . n], B [–1 . . n, 1 . . m] and C [–n . . 0, –2 . . 4] ?

(A) n; (n + 1) m; and 6n

(B) n + 1; (n + 2) m; and 6 (n + 1)

(C) (n + 1); (n + 2) m; and 7 (n + 1)

(D) None of the above

22. Which one of the following statements is *false* ?

(A) Elements of a linked list are stored contiguously in memory

(B) The link field of a linked list contains the address of the next element

(C) Every element of a linked list must be a record with a minimum of two fields

(D) Creation of linked list requires support of pointer data type and record data type

23. Given a queue Q with the elements A, B and C already present in it, what will be the contents of the queue after each of the following steps :

delete (Q); delete (Q); insert (Q, D); insert (Q, E)

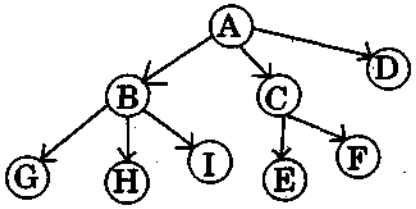
(A) ABC; ABC; ABCD; ABCDE

(B) BC; C; CD; CDE

(C) BA; A; AD; ADE

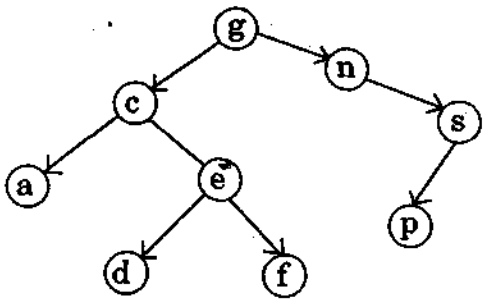
(D) BA; A; DA; EDA

24. In the following tree, find the degree of the tree and degrees of nodes C and D :



(A) 9; 4; 2 (B) 9; 2; 0 (C) 5; 2; 0 (D) 3; 2; 0

25. Consider the binary search tree given below :



How many comparisons will be made while inserting the following keys :

t; b

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

26. Which one of the following is a standard for public switched data network ?

(A) 802.11 (B) X . 25 (C) V . 35 (D) 10 Base T

27. A class C network has a subnet mask of 255.255.255.192. How many hosts can there be on each subnet ?

(A) 30 (B) 64 (C) 63 (D) 32

28. Which of the following is *false* ?

(A) Window size is one of the fields in TCP header

(B) TCP packet can contain 65535 bytes including header information

(C) TCP header does not contain checksum field

(D) TCP packet can be further fragmented by layers below

29. Total datarate in a narrowband ISDN line is :

(A) 64 kbps (B) 144 kbps

(C) 128 kbps (D) 80 kbps

30. In which of the following routing, each router receives vectors from its neighbour ?

(A) Shortest path (B) Distance vector

(C) Link vector (D) Distributed routing

31. Which of the following is *not* an output of an assembler ?

(A) Executable program

(B) Source listing with line numbers and errors

(C) A symbol table

(D) Object program containing machine opcodes

32. The class of context free grammars is *not* closed under :

(A) Union (B) Concatenation

(C) Repeated concatenation (D) Intersection

33. The action of parsing the source program into the proper syntactic classes is known as :

(A) Syntax Analysis
(B) Semantic Analysis
(C) Interpretation Analysis
(D) Lexical Analysis

34. A "bug" is a logical fault in a programming system which causes unexpected or undesirable results under certain input conditions. During the life-cycle of a software system, a bug can be :

(A) Detected
(B) Isolated
(C) Repaired
(D) All of these

35. Consider the grammar G where the productions are numbered as shown :

(1) $E \rightarrow E + T$

(2) $E \rightarrow T$

(3) $T \rightarrow T * F$

(4) $T \rightarrow F$

(5) $F \rightarrow (E)$

(6) $F \rightarrow a$

If a shift reduce (bottom up) parser writes the production number used immediately after performing any reduction, what string will be printed if the parser input is :

a + a * a ?

(A) 62461
(B) 64264631
(C) 6364231
(D) 6262441

36. Total time to prepare a diskdrive mechanism for a block of data to be read from it is :

(A) Latency

(B) Latency plus transmission time

(C) Latency plus seek time

(D) Latency plus seek time plus transmission time

37. If the number of bits in the virtual address of a program is 16 and the page is 0.5 k-bytes, the number of pages in virtual address space is :

(A) 16 (B) 32 (C) 64 (D) 128

38. Semaphore :

(A) synchronizes critical resource to prevent deadlock

(B) synchronizes internal resources to prevent contention

(C) are used to do I/O

(D) are used for memory management

39. Which of the following commands is used to identify file by its context ?

(A) ls (B) cat (C) file (D) None of these

40. Which command is used to copy all files having string *chap* and any two characters after that to a directory *progs* ?

(A) cp chap?? progs (B) cp chap* progs

(C) cp chap[12] /progs/* (D) cp chap?? /progs/*

41. In the context of prototyping-based development process, some of the following statements are true while others are false :

(a) Development of the prototype undergoes design, coding and testing, but each of these phases is not done very formally or thoroughly.

(b) The aim of the prototype is to result in more stable requirements that change less frequently.

(c) A prototype ultimately becomes the actual software system after going through a number of iterations and after incorporating users feedback.

Which one of the following options correctly represents the truthness of the above three statements ?

(A) True; True; True (B) True; False; True

(C) True; False; False (D) True; True; False

42. Some of the following statements are true while others are false :

(a) Project management includes scheduling, monitoring and controlling

(b) Scheduling, monitoring and controlling can go simultaneously.

(c) The pre-requisite for scheduling of a software project is completion of requirement analysis and system design.

Which one of the following options correctly represents the truthness of the above three statements ?

(A) True; True; True

(B) True; False; False

(C) True; False; True

(D) True; True; False

43. Match quality of information and how it is ensured using the following list :

Quality	How Ensured
(a) Up to date	(e) Include all data to present time
(b) Brief	(f) Give at right time
(c) Significance, understandable	(g) Use attractive format and graphical chart

Which one of the following matches is valid ?

(A) (a) and (f)

(B) (b) and (g)

(C) (c) and (g)

(D) (a) and (g)

44. Object are :

(a) Tangible entities

(b) Intangible entities

(c) Transient entities

(d) Uniquely identifiable

Which one of the following options best represents objects ?

(A) a, b

(B) a, b, c

(C) a, b, c, d

(D) a, b, d

45. The main objective of testing are :

(a) When correct inputs are fed to the system, the outputs are correct.

(b) When incorrect inputs are fed to the system, they are detected and rejected.

(c) The requirement specifications are correct.

(d) Verify that the controls incorporated in the system function correctly.

Which one of the following options is valid ?

(A) a, b (B) a, b, c (C) a, b, c, d (D) a, b, d

46. Pick up the *incorrect* statement from the following :

(A) The use of a wireless medium will impose the restrictions on the distances and geography of the network

(B) Radio wave LANs provides a broad range of flexibility and portability

(C) Unwired planet created Handheld Device Markup Language (HDML) to serve as the development standard for wireless applications, in 1998

(D) None of the above

47. Pick up the *incorrect* statement from the following :

(A) Programs running in Windows can share routines that are located in other field called "dynamic-link libraries".

(B) Program written for Windows do directly access the hardware of graphics display devices such as the screen and printer

(C) Window 1.0 through Window 3.1 used the segmented memory mode of the 16-bit microprocessor

(D) None of the above

48. The Message Box function in Window is designed to display :

(A) Short messages (B) Long messages

(C) Animated messages (D) None of these

49. A.....is a collection of current and historical operational data stored for use in ESS and DSS.

(A) Data warehouse (B) Data mining

(C) Database (D) None of these

50. Which of the following organizations cannot be classified as MIND machine ?

(A) Butterfly network (B) Hypercube network

(C) Pipeline machine (D) None of these

ROUGH WORK

ROUGH WORK

SEAL