COMPUTER SCIENCE & APPLICATIONS

Paper - II

Signature of Invigilators

OCT–11/19

Roll No. | | | | | |

(In figures as in Admit Card)

1. .....

Roll No. .....

2. .....

.....

(in words)

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 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. Extra 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.
8. There shall be no negative marking.
9. Use of calculator or any other electronic devices is prohibited.

પરીક્ષાર્થીઓ માટે સૂચનાઓ :

૧. આ પાનાની ટોચમાં દર્શાવેલી જગ્યામાં તમારો રોલનંબર લખો.

૨. આ પ્રશ્નપત્રમાં બહુવૈકલ્પિક ઉત્તરો ધરાવતા કુલ **પચાસ (૫૦)** પ્રશ્નો આપેલા છે. **બધા જ** પ્રશ્નો ફરજિયાત છે.

૩. પ્રત્યેક પ્રશ્ન વધુમાં વધુ 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] અથવા [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 નિરીક્ષકને સોપી દેવી. કોઈપણ કાગળ પરીક્ષા ખંડની બહાર લઈ જવો નહીં.

૮. ખોટા જવાબ માટે નેગેટિવ ગુણાંકન પ્રથા નથી.

૯. કેલ્કયુલેટર અને ઈલેકટ્રોનિક યંત્રોનો પ્રયોગ કરવાની મનાઈ છે.

SEAL

COMPUTER SCIENCE & APPLICATIONS

PAPER-II

Note : This paper contains **FIFTY (50)** multiple-choice/matching questions, each question carrying **TWO (2)** marks. Attempt **All** the questions.

---

1. If X is the number of edges in a connected graph G and Y is the number of vertices in a spanning tree of G, then which of the following cannot be true ?

   (A) $X > Y$ (B) $X = Y - 1$

   (C) $X < Y$ (D) $X < Y - 1$

2. A language represented by a non-deterministic finite state automaton is :

   (A) context-free language (B) context-sensitive language

   (C) regular language (D) natural language

3. The minimum number of vertices of a binary tree of height 5 is :

   (A) 63 (B) 64

   (C) 11 (D) 19

4. The introduction of a parity bit while transmitting a binary string over a communication channel allows the following (Assume that not more than 1 bit can change during the transmission) :

   (A) Error correction (B) Error detection

   (C) Both (A) and (B) (D) Neither (A) nor (B)

5. Which of the following is *true* ?

(A) The inverse of a function $f : X \rightarrow Y$ is always a function.

(B) The inverse of a relation $R : X \rightarrow Y$ is always a relation.

(C) The inverse of a one-to-one function $f : X \rightarrow Y$ is always a one-to-one function.

(D) The inverse of an onto function $f : X \rightarrow Y$ is always onto function.

6. Which of the following Boolean formula is false most often (takes value 0 for more combinations of input values for x and y) ?

(A) x OR y (B) NOT(x) OR y

(C) NOT(x) OR NOT(y) (D) x XOR y

7. What is the minimum number of gates required to implement the Boolean function (A AND B) OR C if we have to use only 2-input NOR gates ?

(A) 2 (B) 3

(C) 4 (D) 5

8. If a number requires 6 hexadecimal digits for its representation, what is the minimum number of octal digits required to represent it ?

(A) 6 (B) 7

(C) 8 (D) 9

9. Consider the first order logic formula

NOT(for all x, y (Boy(x) AND Girl(y)) IMPLIES Taller(x, y))

where Boy(x) means "x is a boy", Girl(y) means "y is a girl", and Taller(x, y) means "x is taller than y". Which of the following is the *correct* meaning ?

(A) All boys are taller than some girl.

(B) Some girl is taller than some boy.

(C) Some boy is taller than all girls.

(D) Some boy is taller than some girl.

10. How many different states can be represented by a 6-bit ring counter ?

(A) 128 (B) 64

(C) 36 (D) 6

11. Which of the following data structures uses the least memory ?

(A)
```
struct astruct
{
    int x;
    float y;
    int v;
};
```

(B)
```
union aunion
{
    int x;
    float v;
    char array[4];
};
```

(C) `char array[12];` (D) `int a[4];`

12. What does a derived class inherit from a base class ?

(A) Only the Public members of the base class.

(B) Only the Protected members of the base class.

(C) Both the Public and the Protected members of the base class.

(D) All the members of the base class.

13. Which of the following statements about constructors is *false* ?

(A) A constructor has the same name as the class name.

(B) A constructor is responsible for the initialization of an object's fields.

(C) Constructor methods have no return type.

(D) A class can have only one constructor.

14. What is the output of the following code ?

```
#include<stdio.h>
main( )
{
        int retval;
        retval = myfunc(5);
        printf("%d", retval);
        retval = myfunc(6);
        printf("%d", retval);
        retval = myfunc(7);
        printf("%d\n", retval);
}
myfunc(int val)
{
        static int mynum = 1;
        mynum = mynum * val;
        return(mynum);
}
```

(A) 5 36 49 (B) 5 6 7

(C) 5 30 210 (D) 25 36 49

15. What does 7/9*9 equal (in C and C++) ?

(A) 7 (B) 1

(C) 0.08642 (D) 0

16. In the formal relational model terminology a row is called :

(A) an attribute (B) a relation

(C) a tuple (D) an entity

17. A relation is defined as a set of :

(A) columns (B) entities

(C) keys (D) tuples

18. Which of the following statements is *false* for the JOIN operation ?

(A) It is a binary operation.

(B) It forms a cartesian product of its arguments, and performs a selection forcing equality on those attributes that appear in both relation schemas.

(C) It enables us to process more than one table at a time.

(D) The number of tuples in the output table of the JOIN operation will be equal to the product of the number of tuples of the individual tables being joined.

19. GRANT is a command under :

(A) DDL (B) DML

(C) DCL (D) Meta Language

20. Which operator can replace the IN operator in the WHERE clause ?

(A) AND (B) OR

(C) BETWEEN (D) LIKE

21. If the inorder traversal of the binary tree T is A D B G C F E and each node of T has either 0 or 2 children, which of the following nodes is *not* a leaf of that tree ?

(A) B (B) C

(C) D (D) E

22. If an undirected graph with n vertices and e edges is represented using an adjacency list, what will the total number of nodes in the adjacency lists be ?

(A) n (B) e

(C) 2e (D) 2n

23. Which traversal is best suited to delete all the nodes of a binary tree ?

(A) Pre-order (B) Post-order

(C) In-order (D) Level-order

24. The running time to insert, find-max, and find-min in a max heap are :

(A) O(log n), O(1) and O(n)

(B) O(log n), O(log n) and O(log n)

(C) O(n), O(log n) and O(n)

(D) O(log n), O(1) and O(log n)

25. Suppose we are implementing quadratic probing with a Hash function Hash(X) = X mod 100. If an element with key 2691 is inserted and the first four locations attempted are already occupied, then the next cell that will be tried is :

(A) 16 (B) 10

(C) 7 (D) 1

26. A computer C has IP address 10.105.1.14 and subnetmask 255.255.128.0. Which of the following IPs is *not* on the same network as C ?

(A) 10.105.1.212 (B) 10.105.212.14

(C) 10.105.22.222 (D) 10.105.111.111

27. The Data Link layer is really two separate layers. What are they ?

(A) Frame Access Control and Logical Link Control

(B) Logical Link Control and Media Access Control

(C) Link Control and Access Control

(D) Data Link Control and Network Access Control

28. Ethernet protocol (CSMA/CD) uses a minimum packet size for the following reason :

(A) to utilize bandwidth well.

(B) to allow encryption key exchange.

(C) to ensure collision detection.

(D) to allow broadcast.

29. When a sender detects a packet loss in the TCP/IP protocol, it does the following :

(A) stops sending for a short duration

(B) retransmits the packet 5 times.

(C) increases its time out value.

(D) halves the size of transmit window.

30. The Domain Name Service (DNS) is used to :

(A) Obtain the IP address given a domain name.

(B) Determine if a server belongs to same domain.

(C) Obtain the default gateway (router) address for a domain.

(D) Obtain a valid IP address when computer boots.

31. Symbol table is used in resolving type conflict during :

(A) The lexical analysis (B) The syntactic analysis

(C) The code generation (D) Semantic analysis

32. The Lex transforms the input patterns into a :

(A) Transition diagram. (B) Symbol table.

(C) SLR parsing table. (D) Regular expression.

33. If every production is either of the form $A \rightarrow BC$ or $A \rightarrow a$, where A, B, and C are non-terminals and a is a terminal, then a grammar is said to be in :

(A) BNF (B) CNF

(C) LL(0) (D) LR(0)

34. Shift reducing is a form of :

(A) Bottom-Up parsing.

(B) Top-Down parsing.

(C) Both Bottom-Up and Top-Down parsing.

(D) Universal parsing.

35. A Canonical-LR parser can avoid conflicts that are present in :

(A) SLR parsers.

(B) LL(1) parsers.

(C) LALR parsers.

(D) Recursive-Descent parsers.

36. Which of the following is *true* ?

(A) Paging may result in external fragmentation.

(B) Segmentation may cause internal fragmentation.

(C) Swapping allows more processes to be run that can fit the main memory.

(D) Sharing re-entrant code is possible with segmentation, but not with paging.

37. Which of the following is *true* ?

(A) fork( ) returns the PID of the child process to the parent process and a 0 to the child process.

(B) fork( ) returns the PID of the parent process to the child process and a 0 to the parent process.

(C) exec( ) returns the PID of the child process to the parent process and a 0 to the child process.

(D) exec( ) returns the PID of the parent process to the child process and a 0 to the parent process.

38. Which of the following is *false* ?

(A) Monitors and Semaphores are equivalent.

(B) Peterson's two process solution can be generalised to more processes.

(C) The critical section problem can be solved by disabling interrupts in a multiprocessor setting.

(D) The critical section problem can be solved using atomic hardware instructions.

39. The following are the contents of "sample" file.

Space, the final frontier.

These are the voyages of the starship Enterprise.

Its continuing mission -- to explore strange new worlds, to seek out new life and new civilizations, to boldly go where no one has gone before.

What is the output of the command awk '{printf("%s", $3)}' sample ?

(A) final the mission new

(B) a e s f

(C) the the mission new

(D) frontier voyages – civilizations

40. Which one from the following statements is *not* true for wait( ) ?

(A) wait( ) call is used in parent process to wait for termination of child process before starting further execution in it.

(B) wait( ) call is used for process synchronization.

(C) wait( ) call returns PID of the terminated child process.

(D) wait( ) call returns PID of the parent process.

41. Which process model from the following is more appropriate when there are uncertainties in requirements ?

(A) Waterfall model

(B) Prototyping model

(C) Waterfall and Spiral model

(D) Prototyping and Waterfall model

42. Which one from the following is the strongest cohesion ?

(A) Coincidental (B) Logical

(C) Sequential (D) Functional

43. The effort required to transfer the program from one hardware and / or software system environment to another is known as :

(A) Interoperability (B) Portability

(C) Supportability (D) Maintainability

44. Which Black box testing approach from the following considers combinations of input conditions in a systematic way ?

(A) Boundary value analysis

(B) Equivalence class partitioning

(C) Cause-effect graphing

(D) Boundary value analysis and equivalence class partition

45. Programming language support is required for which design concept ?

(A) Information hiding (B) Abstraction

(C) Refinement (D) Abstraction and Refinement

46. E-commerce Architecture *does not* always include :

(A) Physical Network (B) Logical Network

(C) World Wide Web Service (D) Virtual Private Network

47. In Secure Electronic Transaction (SET) protocol a customer sends a purchase order :

(A) encrypted with his public key.

(B) in plain text form.

(C) encrypted with Bank's public key.

(D) Using digital signature system.

48. Which of the following statements is *correct* ?

(A) Data warehouse is same as Database of historical data because their schemas are same.

(B) Concept hierarchy used in Data warehouse is for fact as well as for dimension.

(C) The term "Non-Volatile" appearing in the definition of Data warehouse means that the Data warehouse is not lost when power is switched off.

(D) The term "Integrated" means that the data available in different formats will be transformed to a unified format.

49. Which of the following is *false* ?

(A) Association rule mining searches for relationships between variables.

(B) Clustering is the process of dividing a dataset into mutually exclusive groups such that the members of each group are as "close" as possible to one another, and different groups are as "far" as possible from one another.

(C) Data warehousing is the process of extracting patterns from data.

(D) Classification constructs a model based on the training set and the values (class labels) in a classifying attribute and uses it in classifying new data.

50. Which of the following is *true* ?

(A) HITS stands for Hypertext Induced Topic Search.

(B) The HITS algorithm analyses the content to rank webpages.

(C) The HITS algorithm computes the number of hits on a website dynamically.

(D) HITS stands for Hypertext Induced Traversal Sort.

ROUGH WORK

ROUGH WORK

ROUGH WORK

SEAL