COMPUTER SCIENCE AND APPLICATIONS

Name & Signature of the Invigilator

PAPER-II OMR Answer Sheet No. :

SEPT-16/19

Roll No. :

(in figures as in Hall Ticket)

Roll Number in words : ....

Time : 1.15 Hours| No. of Printed Pages : 16 |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 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 : (A) ● (C) (D) 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 log table etc., is 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 પચાસ (૫૦) પ્રશ્નો આપેલા છે. બધાજ 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 માટે આ કવર પૃષ્ઠની ધાર પર આપેલ સીલ સ્ટીકર કાઢી નાખો. કોઈપણ સંજોગોમાં સીલ સ્ટીકર વગરની કે ખુલ્લી પ્રશ્નપુસ્તિકા સ્વીકારશો નહીં.
   (ii) કવર પૃષ્ઠ પર છપાયેલ નિર્દેશાનુસાર પ્રશ્નપુસ્તિકાના પ્રશ્નો, પૃષ્ઠો અને સંખ્યાને બરાબર ચકાસી લો. ખામીયુક્ત પ્રશ્નપુસ્તિકા કે જેમાં પ્રશ્નો/પૃષ્ઠો ઓછા 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. પછી થી, 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 : (A) ● (C) (D) 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 તે 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 ચિન્હ 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 પરીક્ષાખંડની બહાર લઈ જવું નહીં. પરીક્ષા પૂર્ણ થયા બાદ ઉમેદવાર ઓરીજીનલ પ્રશ્નપુસ્તિકા અને OMR જવાબ પત્રકની ડુપ્લિકેટ કોપી પોતાની સાથે લઈ જઈ શકે છે.
10. માત્ર કાળી/ભૂરી બોલ પોઈન્ટ પેન વાપરવી.
11. કેલ્ક્યુલેટર 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.

SEAL

COMPUTER SCIENCE AND APPLICATIONS
PAPER-II

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

1. For which values of m and n, the following statement is *true* ?

   In any set of m integers, there are two numbers that have the same remainder when divided by n.

   (A) $m = 5, n = 6$ (B) $m = 6, n = 5$

   (C) $m = 5, n = 7$ (D) $m = 5, n = 5$

2. Consider the sub-set S of English letters defined by the statement

   $S = \{x \mid x$ is a vowel and x does not occur in the word *exit*\}

   What is the cardinality of the power set of S ?

   (A) 16   (B) 32

   (C) 4   (D) 8

3. In the set of people, the relation x *is not older than* y does not satisfy which property ?

   (A) transitivity   (B) reflexivity

   (C) antisymmetry   (D) symmetry

4. A language L is accepted by a Finite State Automaton iff it is :

   (A) Context Free   (B) Context Sensitive

   (C) Recursive   (D) Regular

5. Which one of the following is *true* for any simple connected undirected graph with more than 2 vertices ?

   (A) No two vertices have the same degree.

   (B) At least two vertices have the same degree.

   (C) At least three vertices have the same degree.

   (D) All vertices have the same degree.

6. If the hexadecimal representation of an integer has 3 digits, how many digits will be there in its octal representation ?

   (A) 2   (B) 3

   (C) 4   (D) 5

7. If a *quad* of 0's is found in the Karnaugh Map of a 4-variable boolean function, how many literals are left in the function after simplification ?

   (A) 1   (B) 2

   (C) 3   (D) 4

8. In a flip-flop made from a Nand-latch, which input combination is prohibited ?

   (A) low-low   (B) low-high

   (C) high-low   (D) high-high

9. In the IEEE standard 754 representation of 32-bit floating point numbers, the number of bits in the exponent part is :

(A) 6   (B) 8

(C) 10   (D) 11

10. By taking 2's complement of the 2's complement of a binary number, one gets :

(A) the 1's complement of the original number.

(B) the 2's complement of the original number.

(C) the original number.

(D) the negative of the original number.

11. What is output of following C language code ?

```
int x, *p = &x;
x = 0;
while (*p==x)
{
        printf ("%d", x++);
        *p = *p + 1;
}
```

(A) Does not print anything

(B) Prints 0, 1, 2, 3, 4, 5 and so on

(C) Prints 0, 2, 4, 6, 8 and so on

(D) Prints 1, 3, 5, 7, 9 and so on

12. In C++, only one copy of the class is inherited, when it is defined as :

(A) Virtual   (B) Static

(C) Public   (D) Private

13. A class that acts only as a base class and is not used to create objects is :

(A) Parent class   (B) Super class

(C) Abstract class   (D) Derived class

14. In C++, a friend function to a class C cannot access :

(A) private data members and member functions

(B) public data members and member functions

(C) protected data members and member functions

(D) the data members of the derived class of C

15. Which of the following statements are *true* about constructors of C++ classes ?

(i) A class can have any number of constructors.

(ii) Constructors can be inherited.

(iii) The address of constructors can be referred.

(iv) Constructors cannot be declared in protected section of the class.

(v) Constructors cannot return values.

(A) (i), (iii), (iv)

(B) (ii), (iii), (iv)

(C) (iii), (iv), (v)

(D) (i), (iv), (v)

16. Let E1 and E2 be two entities in an E/R diagram with simple single-valued attributes. R1 and R2 are two relationships between E1 and E2, where R1 is one-to-many and R2 is many-to-many. R1 and R2 do not have any attributes of their own. What is the minimum number of tables required to represent this situation in the relational model ?

   (A)   2   (B)   3

   (C)   4   (D)   5

17. Which one of the following statements is FALSE regarding normalization ?

   (A)   Any relation with two attributes is in BCNF.

   (B)   A relation in which every key has only one attribute is in 2NF.

   (C)   A prime attribute can be transitively dependent on a key in a 3NF relation.

   (D)   A prime attribute can be transitively dependent on a key in a BCNF relation.

18. A type of query within another SQL query and embedded within the WHERE clause is called :

   (A)   Super query   (B)   Sub query

   (C)   Master query   (D)   Inherited query

19. Which of the following is used for data retrieval from the database ?

   (A)   DDL   (B)   DML

   (C)   SDL   (D)   VDL

20. Which of the following statements is *not correct* ?

    (A)   Data Normalization is the process of defining the table structure.

    (B)   The purpose of class diagrams is to model the interrelationships between the different classes in the database.

    (C)   Individual objects are stored as rows in a table.

    (D)   Properties of an object are stored as columns in a table.

21. How many elements of a 3×3 two dimensional array have the same memory locations in both row major and column major order ?

    (A)   2   (B)   3

    (C)   4   (D)   5

22. Is it possible to find a loop in a Linked list ?

    (A)   Possible in linear time

    (B)   Possible in quadratic time only

    (C)   Depends on the position of loop

    (D)   Not possible

23. If a node in a Binary Search Tree has two children, then its inorder predecessor always has :

    (A)   No child   (B)   No left child

    (C)   No right child   (D)   Two children

24. How many legal min heaps can be formed from values 1, 2, 3, 4 and 5 ?

(A) 8

(B) 6

(C) 16

(D) 24

25. Consider a B-Tree of order 5 created from following keys in the order they come : *c s a m r e z b t d f h g*. How many keys are present in the root node of the B-Tree ?

(A) 1

(B) 2

(C) 3

(D) 4

26. Example of Point-to-Point connection is :

(A) Star topology.

(B) Bus topology.

(C) Changing channels of television by remote.

(D) Both (A) and (C).

27. Initial header to the frame in OSI model is attached at :

(A) Physical layer

(B) Data Link layer

(C) Network layer

(D) Both (A) and (B)

28. Which protocol is used to associate a logical address with a physical address ?

(A) Reverse Address Resolution Protocol

(B) Internet Control Message Protocol

(C) Internet Group Message Protocol

(D) Address Resolution Protocol

29. Which connector is used for a Coaxial cable ?

   (A) RJ45   (B) BNC

   (C) SC   (D) ST

30. Which Data Link layer protocol is *not* used for noisy channels ?

   (A) Stop-and-Wait   (B) Stop-and-Wait ARQ

   (C) Go-Back-N ARQ   (D) Selective Repeat ARQ

31. The purpose of ORIGIN directive in Assembly language is :

   (A) to indicate the starting position of program block to be stored in memory.

   (B) to indicate the locations of all the memroy registers used.

   (C) to indicate the ending position of program block to be ended in memory.

   (D) to indicate the starting position of data.

32. Which one from the following is *false* for Context Free Grammar (CFG) :

   (A) A CFG is said to be ambiguous if there is more than one derivation tree for particular string.

   (B) The left hand side of production rules in CFG is always a terminal symbol.

   (C) Every regular grammar is CFG, but not all CFGs are regular.

   (D) CFG is a 4-tuple.

33. Which system program is useful to combine compiled object code modules into ready to run code ?

    (A)   Compiler   (B)   Linker

    (C)   Loader   (D)   Bootstrap Compiler

34. Which one from the following is *false* for Lex ?

    (A)   Lex is a parser.

    (B)   Lex program consists of declaration and translation rules.

    (C)   Output file generated by Lex has extension .yy.c.

    (D)   Lex is lexical analyzer.

35. The Bottom-Up parser generates :

    (A)   Left most deviation.

    (B)   Right most deviation.

    (C)   Left most deviation in reverse.

    (D)   Right most deviation in reverse.

36. Which one from the following is *false* for scheduling algorithms of operating system ?

    (A)   Starvation is possible in SRT (Shortest Remaining Time) algorithm.

    (B)   Starvation is not possible in Round Robin algorithm.

    (C)   Round Robin algorithm is better than FCFS in terms of response time.

    (D)   When time slices in Round Robin scheduling algorithm of a time shared system is very small then it results to FCFS algorithm.

37. Which page replacement algorithm suffers from Belady's anomaly ?

    (A)   LRU   (B)   FIFO

    (C)   LIFO   (D)   MRU

38. Consider following statements for Unix operating system :

    (I)   The character that can not be used for naming file is / (i.e. slash).

    (II)   The character / (i.e. slash) in command cd / represents root file system.

    (III) The metacharacter * does not match files beginning with a . (dot).

Which one from the following is TRUE ?

    (A)   Statements I and II are True, and III is False.

    (B)   Statements I and III are True, and II is False.

    (C)   Statements I, II and III all are False.

    (D)   Statements I, II and III all are True.

39. Which mechanisms of IPC can be used to communicate data between processes ?

    (A)   Pipes, Messages and Semaphores

    (B)   Messages, Shared Memory and Signals

    (C)   Pipes, Semaphores and Shared Memory

    (D)   Pipes, Messages and Shared Memory

40. Compaction is a technique to overcome :

    (A) external fragmentation.

    (B) internal fragmentation.

    (C) the problem of starvation.

    (D) the problem of limiting the number of active processes.

41. Which one from the following is FALSE ?

    (A) White Box technique attempts to find incorrect or missing functions, and errors in database access.

    (B) Boundary value analysis belongs to Black Box technique.

    (C) A Product metric is used to measure the characteristic of documentation and code.

    (D) Conditional Coverage is a White box technique.

42. To identify defects in the interfaces and in interaction between integrated components is :

    (A) Regression testing   (B) System testing

    (C) Integration testing   (D) Component testing

43. Software structural quality refers to how it meets :

    (A) Functional requirements

    (B) Non-functional requirements

    (C) Structured testing

    (D) Structured code requirements

44. Which one from the following is FALSE ?

    (A)   Refactoring helps in reducing coupling and increasing cohesion.

    (B)   The basic objective of refactoring is to improve coding.

    (C)   A better design has an objective of high cohesion and low coupling.

    (D)   Pair programming coding process is associated with extreme programming.

45. Aggregations means identification of :

    (A)   components   (B)   objects

    (C)   classes   (D)   architecture

46. Which unit commonly used to measure the processing speed of super computers now a days ?

    (A)   PFLOPS   (B)   PIPS

    (C)   MFLOPS   (D)   MIPS

47. In K-nearest neighbor algorithm, K stands for :

    (A)   Number of nearest training samples

    (B)   Number of nearest testing samples

    (C)   Number of iterations

    (D)   Number of total records

48. Data scrubbing is :

   (A)   A process to reject data from the data warehouse and to create the necessary indexes.

   (B)   A process to load the data in the data warehouse and to create the necessary indexes.

   (C)   A process to upgrade the quality of data after it is moved into a data warehouse.

   (D)   A process to upgrade the quality of data before it is moved into a data warehouse.

49. WiFi is :

   (A)   Simplex   (B)   Full Duplex

   (C)   Half Duplex   (D)   Triplex

50. The Secure Electronic Transaction protocol is used for :

   (A)   Credit card payment

   (B)   Cheque payment

   (C)   Electronic cash payments

   (D)   Payment of small amounts for internet services

ROUGH WORK