

COMPUTER SCIENCE AND APPLICATIONS

Name & Signature of the Invigilator

PAPER-II
SEPT/13/19

ICR Answer Sheet No. :

Roll No. :

Roll Number in words :

Time : 1.15 Minutes

No. of Printed Pages : 20

[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. At the commencement of examination, the question booklet will be given to candidate. In the first 5 minutes, candidate is 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 five 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 in the ICR answer sheet and the ICR Answer Sheet number should be entered on this test booklet.
4. 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
5. Your responses to the items for this paper are to be indicated on the ICR Answer Sheet under Paper II only.
6. Read instructions given inside carefully.
7. Rough work is to be done in the end of the booklet only.
8. You have to return the original ICR Answer Sheet to the invigilators at the end of the examination compulsorily and must not carry it with you outside the examination hall. You are, however, allowed to carry duplicate copy of ICR sheet and test booklet on conclusion of the examination.
9. Use black ball point pen.
10. Use of any Calculators or log tables or any other electronic devices is prohibited.
11. There shall be no negative marking.
12. In case of any discrepancy in Gujarati and English version of questions the English version should be taken as final.

પરીક્ષાર્થીઓ માટે સૂચનાઓ :

1. આ પાનાની ટોચમાં દર્શાવેલી જગ્યામાં તમારો રોલનંબર લખો.
2. આ પ્રશ્નપત્રમાં બહુવિકલ્પિક ઉત્તરો ઘરાવતા કુલ પચાસ (૫૦) પ્રશ્નો આપેલા છે. બધા જ પ્રશ્નો કરજિયાત છે.
3. પરીક્ષાની શરૂઆતમાં ઉમેદવારને પ્રશ્નપુસ્તિકા આપવામાં આવશે. પ્રથમ ૫ મિનિટ દરમ્યાન, ઉમેદવારે પ્રશ્નપુસ્તિકા ખોલી અને કરજિયાતપણે નીચે મુજબ પરીક્ષણ કરવું.
 - (i) પ્રશ્નપુસ્તિકાનો વપરાશ કરવા માટે આ કવર પેજની ઘાર પર આપેલ સીલ ફાડી નાખો. કોઈપણ સંજોગોમાં સીલ સ્ટીકર વગરની કે ખુલ્લી પ્રશ્નપુસ્તિકા સ્વીકાર શો નહીં.
 - (ii) કવર પૃષ્ઠ પર છપાયેલ નિર્દેશાનુસાર પ્રશ્નપુસ્તિકાના પ્રશ્નો પૂર્ણ અને સંપૂર્ણભરખર ચકાસી લો. ખામીયુક્ત પ્રશ્નપુસ્તિકા કે જેમાં પૃષ્ઠો/પ્રશ્નો ઓછા હોય, બે વાર છપાયા હોય, અનુક્રમમાં અથવા કોઈ અન્ય કારકોષ્ય અર્થમાં કોઈપણ કારણે ખામીયુક્ત પ્રશ્નપુસ્તિકા સ્વીકારવી નહીં. એને જો ખામીયુક્ત પ્રશ્નપુસ્તિકા મળી હોય તો નિરીક્ષક પાસેથી તુરંત જ બીજા સારી પ્રશ્નપુસ્તિકા મેળવી લેવી. આ માટે ઉમેદવારને પાંચ મિનિટનો સમયઆળો આપવામાં આવશે. પછીથી, પ્રશ્નપુસ્તિકા બદલવામાં આવશે નહીં કે કોઈ વધારાનો સમય પણ આપવામાં આવશે નહીં.
 - (iii) આ ચકાસણી સમાપ્ત થાયપછી, ટેસ્ટ પુસ્તિકા નંબર ICR જવાબ પત્રકમાં લખવો અને ICR જવાબ પત્રક નંબર પ્રશ્નપુસ્તિકા પર લખવો.
4. પ્રત્યેક પ્રશ્ન માટે ચાર ઉત્તર વિકલ્પ (A), (B), (C) અને (D) આપવામાં આવેલ છે. પસંદગીનો જવાબ માત્ર અંગ્રેજી કેપીટલ મૂલ્યાંકન દ્વારા જ આપવો. પસંદ કરેલ અંગ્રેજી કેપીટલ અક્ષર આપેલ ખાનામાં સંપૂર્ણ રીતે સમાઈ જાય તે રીતે લખવો.

સાચી રીત :



ખોટી રીત :



અથવા



5. આ પ્રશ્નપુસ્તિકાના પ્રશ્નોના જવાબ અલગથી આપવામાં આવેલ ICR જવાબ પત્રકમાં પેપર-૨ લખેલ વિભાગમાં જ લખવા.
6. અંદર આપેલ સૂચનાઓ ધ્યાનપૂર્વક વાંચો.
7. આ પ્રશ્નપુસ્તિકાની અંતે આપેલ પાનું રફ કામ માટે છે.
8. પરીક્ષા સમય પૂરો થઈ ગયા પછી ઓરીક્ષકનલ ICR જવાબ પત્રક જે તે નિરીક્ષકને ફરજિયાત સોંપી દેવું અને કોઈપણ સંજોગોમાં પરીક્ષાખંડની બહાર જઈ શકશે નહીં. પરીક્ષા પૂર્ણ થયા બાદ ઉમેદવાર પ્રશ્નપુસ્તિકા તથા ICR જવાબવહીની કુલિકેટ કોપી પોતાની સાથે લઈ જઈ શકે છે.
9. માત્ર કાળી પેન/કાળી બોલ પેન વાપરવી.
10. કેલ્ક્યુલેટર અને અન્ય ઈલેક્ટ્રોનિક ધંત્રોનો ઉપયોગ કરવાની મનાઈ છે.
11. ખોટા જવાબ માટે નેગેટિવ ગુણાંકન પ્રથા નથી.
12. પ્રશ્નપુસ્તિકાના કોઈ પ્રશ્નમાં અનુવાદ અંગે કોઈ વિવાદ/ખતભેદ જણાય તો અંગ્રેજી વર્ઝન યોગ્ય ગણાશે.

1. Preparation of the sample
2. Measurement of the rate
3. Calculation of the rate constant

4. Discussion of the results

5. Conclusion

A

A

A

6. Appendix

7. References

A

A

A

8. Acknowledgments

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. What is the minimum height possible for a binary tree of 17 vertices ?
(A) 2 (B) 3
(C) 4 (D) 5
2. If 13 things are placed in 10 boxes, what is the minimum number of boxes that should have a minimum of 2 things in them ?
(A) 1 (B) 2
(C) 3 (D) 4
3. Which of the following statements is *False* regarding formal languages ?
(A) Every regular language is a context-free language.
(B) Every regular language is a context-sensitive language.
(C) Every context-free language is a context-sensitive language.
(D) Every context-sensitive language is a context-free language.
4. Which of the following statements is *true* regarding connected graphs ?
(A) No Eulerian graph is a Hamiltonian graph.
(B) Every Hamiltonian graph is a Eulerian graph.
(C) A graph can be neither Eulerian nor Hamiltonian.
(D) A Hamiltonian graph cannot be a Eulerian graph.

5. A box contains 50 balls with numbers 1 to 50 written on them. In an event, four balls with the labels 13, 5, 27 and 35 are drawn from the box. Let p be the probability of drawing this sequence of balls with the policy of sampling with replacement and q is the probability of the same event with the policy of sampling without replacement. Which of the following relationships is valid between p and q ?

(A) $p < q$

(B) $p > q$

(C) $p = q$

(D) $p + q = 1$

6. The result of addition of two octal numbers 367 and 715, in the octal number system is :

(A) 1072

(B) 1102

(C) 1304

(D) 1021

7. A CMOS gate can use a supply voltage V_{DD} of :

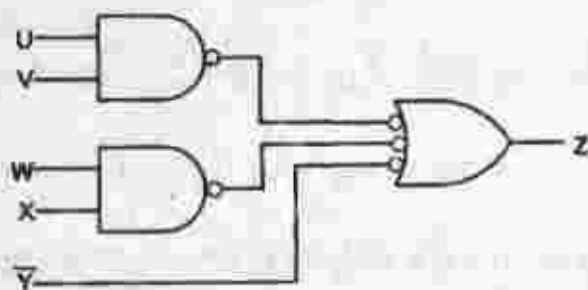
(A) +2 volts

(B) +12 volts

(C) +18 volts

(D) +24 volts

8. The product of all maxterms of a Boolean function of n variables is :
- (A) zero (B) positive
(C) high (D) one
9. TTL SSI come mostly in 14-pin packages. Two pins are reserved for power supply and the other pins are used to input and output terminals. How many gates are enclosed in one such package if it contains 3-input AND gates ?
- (A) 1 (B) 2
(C) 3 (D) 4
10. The function Z for the logic diagram shown below is :



- (A) $Z = \overline{UV} + \overline{WX} + Y$ (B) $Z = UV + WX + Y$
(C) $Z = UV + \overline{WX} + Y$ (D) $Z = \overline{UV} + WX + \overline{Y}$

11. Evaluate $fn(7)$ as per the following code :

```
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;
```

What will be the value returned ?

- (A) 10 (B) 11
(C) 1 (D) 12

12. Overloaded functions :

- (A) are a group of functions with the same name in the same class.
(B) are functions with very complex code.
(C) should be avoided, as they fail frequently because of extra load.
(D) are a group of functions with the same name in different classes.

13. How many times will the following loop be executed ?

```
for (int x=0; x=3; x++)
```

- (A) Zero (B) Three
(C) Infinite (D) Once

14. Which of the following language features is *not* an access specifier in C++ ?

- (A) public (B) private
(C) protected (D) default

15. Consider the following program segment :

```
class A { public :  
    A ( ) { cout << "Constructing A " ; }  
    ~ A ( ) { cout << "Destructing A " ; }  
};  
  
class B : public A { public :  
    B ( ) { cout << "Constructing B " ; }  
    ~ B ( ) { cout << "Destructing B " ; }  
};  
  
int main ( ) {  
    B obj ;  
    return 0 ;  
}
```

The output of the program will be :

- (A) Constructing A Destructing A Constructing B Destructing B
(B) Constructing A Constructing B Destructing A Destructing B
(C) Constructing A Constructing B Destructing B Destructing A
(D) Constructing B Constructing A Destructing A Destructing B

16. A primary key :
- (A) may be a composite key which consists of composite attribute(s).
 - (B) can be used as a secondary key but a secondary key cannot be a primary key.
 - (C) can be any one of the candidate keys because a candidate key is a minimal superkey which uniquely identifies each row in a table.
 - (D) may contain a derived attribute.
17. An existence-independent entity is an entity :
- (A) for which it is not mandatory to have a foreign key.
 - (B) which can exist in the database only when it is associated with another related entity occurrence.
 - (C) which does not have any derived attribute.
 - (D) whose primary key cannot be used as a foreign key in other entities.

18. Which of the following groups are only DML commands ?
- (A) Rename, update, delete
 - (B) Insert, delete, alter
 - (C) Delete, rename, update, insert
 - (D) Update, insert, delete
19. What will happen when a user tries to add a default value to a column after the table already has some data, using ALTER TABLE command ?
- (A) Existing NULL values in the table are converted to the default value.
 - (B) Only subsequent inserts in the table will get the default value.
 - (C) The command is invalid and an error message is displayed.
 - (D) The command will not work because the table has to be empty for the command to work.

20. What is the maximum privilege that can be granted on a view ?
- (A) SELECT, INSERT, DELETE
 - (B) SELECT, INDEX, ALTER, DELETE
 - (C) INSERT, UPDATE, SELECT, DELETE
 - (D) INSERT, UPDATE, SELECT, ALTER
21. If we have six stack operations—pushing and popping each of A, B and C—such that push(A) must occur before push(B) which must occur before push(C). Then A, C, B is a possible order for pop operations, since this could be our sequence: push (A), pop(A), push(B), push(C), pop(C), pop(B). Which one of the following orders could not be the order the pop operations are run in, if we are to satisfy the requirements described above ?
- (A) A B C
 - (B) C B A
 - (C) B A C
 - (D) C A B
22. 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 node of that tree ?
- (A) B
 - (B) C
 - (C) D
 - (D) E

23. The running time to remove the first, last and middle elements of a circular linked list are :

(A) $O(1)$, $O(1)$, $O(n)$

(B) $O(n)$, $O(1)$, $O(n)$

(C) $O(1)$, $O(n)$, $O(n)$

(D) $O(1)$, $O(1)$, $O(1)$

24. An advantage of linked lists over dynamically allocated arrays is :

(A) Linked lists generally use less memory.

(B) The size of a dynamically allocated array must be known when the program is compiled.

(C) Inserting at the beginning of a linked list is faster than inserting at the beginning of an array.

(D) Accessing the last element is faster in linked lists than in arrays.

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

(A) 1

(B) 2

(C) 3

(D) 4

26. Which type of firewall monitors traffic on several layers of the OSI model ?
- (A) Packet-filtering firewall (B) Circuit-level gateway
(C) Application-level gateway (D) Stateful-inspection firewall
27. The traditional home telephone cable uses which type of wired transmission cable ?
- (A) Coaxial (B) Fibre-optic
(C) Twisted-pair (D) UTP
28. The purpose of Network Address Translation is to :
- (A) translate IP address from the Internet.
(B) dynamically assign IP addresses via an ISP.
(C) hide user IP address from the Internet.
(D) convert logical ports to physical port configurations.
29. Default mask for 193.14.56.22 is :
- (A) 0.0.0.0 (B) 255.0.0.0
(C) 255.255.0.0 (D) 255.255.255.0

30. In the IPV4 header, the fragment offset (3 bits) is used in conjunction with which of the following header fields ?

- (A) Flags
- (B) Protocol
- (C) Options
- (D) Service Type

31. An annotated parse tree is a parse tree :

- (A) with value of only some attributes shown at parse tree nodes.
- (B) with attribute values shown at the parse tree nodes.
- (C) without attribute values shown at the parse tree nodes.
- (D) with grammar symbols shown at the parse tree nodes.

32. Shift-reducing parsing is a :

- (A) Bottom-up Lexical analysis
- (B) Bottom-up Syntax analysis
- (C) Top-down Syntax analysis
- (D) Top-down Lexical analysis

33. A symbol table :
- (A) helps in lexical analysis to resolve conflicts
 - (B) helps in semantic analysis for evaluating how much and what type of run-time space is to be allocated
 - (C) is used during lexical analysis
 - (D) is built during semantic analysis
34. Which of the following statements is *not true* ?
- (A) The INR and DCR instructions do not affect the Carry Flag, even if the result is larger than the register size.
 - (B) The Zero Flag is set only when all bits in the result are zero.
 - (C) The subtract operation is performed by using 1's complement method.
 - (D) If the result of subtraction is negative, the answer is in 2's complement and carry (i.e. borrow) flag is set.
35. Basic functions of a loader are :
- (A) Allocation, linking and relocation
 - (B) Allocation, linking and loading
 - (C) Linking, relocation and loading
 - (D) Allocation, linking, relocation and loading

36. fork() call :

- (A) returns 0 (zero) to the child process
- (B) returns PPID to the child process
- (C) returns non-zero value to the child process
- (D) returns PID of the child process to itself

37. Binary semaphore is used to implement :

- (A) Circular wait
- (B) Mutual exclusion
- (C) Hold and Wait
- (D) No pre-emption

38. Which disk scheduling algorithm achieves maximum locality ?

- (A) FIFO
- (B) SSTF
- (C) LIFO
- (D) SCAN

39. A FIFO page replacement strategy can be implemented with relatively low overhead using :

- (A) Queue
- (B) Stack
- (C) Hash Table
- (D) Binary tree

40. Virtual memory is :

- (A) a technique to allow an executable code of size larger than the size of the main memory to run.
- (B) a part of main memory exclusively used for swapping purposes.
- (C) a technique to allow an executable code of size smaller than the size of the main memory to run.
- (D) a part of main memory exclusively used for fragmentation purpose.

41. Which statement below is *not* true ?

- (A) Usecase diagram is a requirement modelling diagram.
- (B) Decision tables model the business rules.
- (C) Number of classes in the class diagram should exactly match the number of entities in the E-R diagram.
- (D) Activity diagram is similar to flowchart except that the flowchart does not provide for execution of parallel activities.

42. Which type of cohesion is least preferable ?

(A) Functional

(B) Coincidental

(C) Temporal

(D) Sequential

43. What is the output of the following C++ code ?

```
#include <iostream.h>
```

```
int Myfunc(int x) {
```

```
    if (x == 0) return 0;
```

```
    if (x == 1) return 1;
```

```
    return Myfunc(x - 1) + Myfunc(x - 2);
```

```
}
```

```
int main( ) {
```

```
    cout << Myfunc(6) << endl ;
```

```
    return 0;
```

```
}
```

(A) 4

(B) 8

(C) 1

(D) 5

44. Which of the following types of coupling is the best ?
- (A) Control coupling (B) Content coupling
- (C) Common coupling (D) Merge coupling
45. Prototype SDLC models are :
- (A) types of evolutionary software development
- (B) types of exploratory software development
- (C) types of big-bang software development
- (D) enhancement of waterfall model only
46. For secure EDI transmission on Internet :
- (A) MIME is used (B) S/MIME is used
- (C) PGP is used (D) TCP/IP is used
47. For carrying out C2C e-Commerce, which one of the following infrastructure is essential ?
- (A) World Wide Web (B) Intranet network
- (C) EDI standard (D) Secure payment services

48. Datawarehouses contain :
- (A) Operational data
 - (B) Historical data
 - (C) Huge volume of knowledge
 - (D) Operational as well as historical data
49. A digital signature :
- (A) is a bit string giving identity of the parties.
 - (B) is the unique identification of a sender.
 - (C) leads to non-replication of transactions by the sender as well as by the receiver.
 - (D) is an encrypted signature of the receiver.
50. A firewall may be implemented in :
- (A) routers which connect Intranet to Internet.
 - (B) bridges used in an Intranet.
 - (C) modem.
 - (D) application programs.

ROUGH WORK

SEAL