Paper : **II**

Subject : **COMPUTER SCIENCE AND APPLICATIONS**

Subject Code : **24**

Roll No. | | | | | | | | |

(Figures as per admission card)

OMR Sheet No. : _____

BOOKLET SERIAL NO.

Name & Signature of Invigilator/s

Signature : _____

Name : _____

Time : 2 Hours | Maximum Marks : 200

Number of Pages in this Booklet : **16** | Number of Questions in this Booklet : **100**

ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಸೂಚನೆಗಳು

1. ಈ ಪುಟದ ಮೇಲ್ತುದಿಯಲ್ಲಿ ಒದಗಿಸಿದ ಸ್ಥಳದಲ್ಲಿ ನಿಮ್ಮ ರೋಲ್ ನಂಬರನ್ನು ಬರೆಯಿರಿ.
2. ಈ ಪತ್ರಿಕೆಯು ಬಹು ಆಯ್ಕೆ ವಿಧದ ನೂರು (100) ಪ್ರಶ್ನೆಗಳನ್ನು ಒಳಗೊಂಡಿದೆ.
3. ಪರೀಕ್ಷೆಯ ಪ್ರಾರಂಭದಲ್ಲಿ, ಪ್ರಶ್ನೆ ಪುಸ್ತಿಕೆಯನ್ನು ನಿಮಗೆ ನೀಡಲಾಗುವುದು. ಮೊದಲ 5 ನಿಮಿಷಗಳಲ್ಲಿ ನೀವು ಪುಸ್ತಿಕೆಯನ್ನು ತೆರೆಯಲು ಮತ್ತು ಕೆಳಗಿನಂತೆ ಕಡ್ಡಾಯವಾಗಿ ಪರೀಕ್ಷಿಸಲು ಕೋರಲಾಗಿದೆ.
   (i) ಪ್ರಶ್ನೆಪುಸ್ತಿಕೆಗೆ ಪ್ರವೇಶಾವಕಾಶ ಪಡೆಯಲು, ಈ ಹೊದಿಕೆ ಪುಟದ ಅಂಚಿನ ಮೇಲಿರುವ ಪೇಪರ್ ಸೀಲನ್ನು ಹರಿಯಿರಿ. ಸ್ಟಿಕ್ಕರ್ ಸೀಲ್ ಇಲ್ಲದ ಅಥವಾ ತೆರೆದ ಪುಸ್ತಿಕೆಯನ್ನು ಸ್ವೀಕರಿಸಬೇಡಿ.
   (ii) **ಪುಸ್ತಿಕೆಯಲ್ಲಿನ ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ ಮತ್ತು ಪುಟಗಳ ಸಂಖ್ಯೆಯನ್ನು ಮುಖಪುಟದ ಮೇಲೆ ಮುದ್ರಿಸಿದ ಮಾಹಿತಿಯೊಂದಿಗೆ ತಾಳೆ ನೋಡಿರಿ. ಪುಟಗಳು/ಪ್ರಶ್ನೆಗಳು ಕಾಣೆಯಾದ ಅಥವಾ ದ್ವಿಪ್ರತಿ ಅಥವಾ ಅನುಕ್ರಮವಾಗಿಲ್ಲದ ಅಥವಾ ಇತರ ಯಾವುದೇ ವ್ಯತ್ಯಾಸದ ದೋಷಪೂರಿತ ಪುಸ್ತಿಕೆಯನ್ನು ಕೂಡಲೆ 5 ನಿಮಿಷದ ಅವಧಿ ಒಳಗೆ, ಸಂವೀಕ್ಷಕರಿಂದ ಸರಿ ಇರುವ ಪುಸ್ತಿಕೆಗೆ ಬದಲಾಯಿಸಿಕೊಳ್ಳಬೇಕು. ಆ ಬಳಿಕ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು ಬದಲಾಯಿಸಲಾಗುವುದಿಲ್ಲ, ಯಾವುದೇ ಹೆಚ್ಚುಸಮಯವನ್ನೂ ಕೊಡಲಾಗುವುದಿಲ್ಲ.**
4. ಪ್ರತಿಯೊಂದು ಪ್ರಶ್ನೆಗೂ (A), (B), (C) ಮತ್ತು (D) ಎಂದು ಗುರುತಿಸಿದ ನಾಲ್ಕು ಪರ್ಯಾಯ ಉತ್ತರಗಳಿವೆ. ನೀವು ಪ್ರಶ್ನೆಯ ಎದುರು ಸರಿಯಾದ ಉತ್ತರದ ಮೇಲೆ, ಕೆಳಗೆ ಕಾಣಿಸಿದಂತೆ ಅಂಡಾಕೃತಿಯನ್ನು ಕಪ್ಪಾಗಿಸಬೇಕು.

   ಉದಾಹರಣೆ : (A) (B) ● (D)

   (C) ಸರಿಯಾದ ಉತ್ತರವಾಗಿದ್ದಾಗ.
5. ಈ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಜೊತೆಯಲ್ಲಿ **ಕೊಟ್ಟಿರುವ OMR ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ನಿಮ್ಮ ಉತ್ತರಗಳನ್ನು ಸೂಚಿಸತಕ್ಕದ್ದು.** OMR ಹಾಳೆಯಲ್ಲಿ ಅಂಡಾಕೃತಿಯಲ್ಲದೆ ಬೇರೆ ಯಾವುದೇ ಸ್ಥಳದಲ್ಲಿ ಉತ್ತರವನ್ನು ಗುರುತಿಸಿದರೆ, ಅದರ ಮೌಲ್ಯಮಾಪನ ಮಾಡಲಾಗುವುದಿಲ್ಲ.
6. OMR ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ಕೊಟ್ಟ ಸೂಚನೆಗಳನ್ನು ಜಾಗರೂಕತೆಯಿಂದ ಓದಿರಿ.
7. ಎಲ್ಲಾ ಕರಡು ಕೆಲಸವನ್ನು ಪುಸ್ತಿಕೆಯ ಕೊನೆಯಲ್ಲಿ ಮಾಡತಕ್ಕದ್ದು.
8. ನಿಮ್ಮ ಗುರುತನ್ನು ಬಹಿರಂಗಪಡಿಸಬಹುದಾದ ನಿಮ್ಮ ಹೆಸರು ಅಥವಾ ಯಾವುದೇ ಚಿಹ್ನೆಯನ್ನು, ಸಂಗತವಾದ ಸ್ಥಳ ಹೊರತು ಪಡಿಸಿ, OMR ಉತ್ತರ ಹಾಳೆಯ ಯಾವುದೇ ಭಾಗದಲ್ಲಿ ಬರೆದರೆ, ನೀವು ಅನರ್ಹತೆಗೆ ಬಾಧ್ಯರಾಗುತ್ತೀರಿ.
9. ಪರೀಕ್ಷೆಯು ಮುಗಿದನಂತರ, ಕಡ್ಡಾಯವಾಗಿ OMR ಉತ್ತರ ಹಾಳೆಯನ್ನು ಸಂವೀಕ್ಷಕರಿಗೆ ನೀವು ಹಿಂತಿರುಗಿಸಬೇಕು ಮತ್ತು ಪರೀಕ್ಷಾ ಕೊಠಡಿಯ ಹೊರಗೆ OMRನ್ನು ನಿಮ್ಮೊಂದಿಗೆ ಕೊಂಡೊಯ್ಯಕೂಡದು.
10. ಪರೀಕ್ಷೆಯ ನಂತರ, ಪರೀಕ್ಷಾ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು ಮತ್ತು ನಕಲು OMR ಉತ್ತರ ಹಾಳೆಯನ್ನು ನಿಮ್ಮೊಂದಿಗೆ ತೆಗೆದುಕೊಂಡು ಹೋಗಬಹುದು.
11. **ನೀಲಿ/ಕಪ್ಪು ಬಾಲ್‌ಪಾಯಿಂಟ್ ಪೆನ್ ಮಾತ್ರವೇ ಉಪಯೋಗಿಸಿರಿ.**
12. **ಕ್ಯಾಲ್ಕುಲೇಟರ್, ವಿದ್ಯುನ್ಮಾನ ಉಪಕರಣ ಅಥವಾ ಲಾಗ್ ಟೇಬಲ್ ಇತ್ಯಾದಿಯ ಉಪಯೋಗವನ್ನು ನಿಷೇಧಿಸಲಾಗಿದೆ.**
13. **ಸರಿ ಅಲ್ಲದ ಉತ್ತರಗಳಿಗೆ ಋಣ ಅಂಕ ಇರುವುದಿಲ್ಲ.**
14. **ಕನ್ನಡ ಮತ್ತು ಇಂಗ್ಲೀಷ್ ಆವೃತ್ತಿಗಳ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಗಳಲ್ಲಿ ಯಾವುದೇ ರೀತಿಯ ವ್ಯತ್ಯಾಸಗಳು ಕಂಡುಬಂದಲ್ಲಿ, ಇಂಗ್ಲೀಷ್ ಆವೃತ್ತಿಗಳಲ್ಲಿರುವುದೇ ಅಂತಿಮವೆಂದು ಪರಿಗಣಿಸಬೇಕು.**

Instructions for the Candidates

1. Write your roll number in the space provided on the top of this page.
2. This paper consists of Hundred multiple-choice type of questions.
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 the cover page. Do not accept a booklet without sticker seal or 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.**
4. Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item.

   Example : (A) (B) ● (D)

   where (C) is the correct response.
5. Your responses to the questions are to be indicated in the **OMR Sheet kept inside this Booklet.** If you mark at any place other than in the circles in the OMR Sheet, it will not be evaluated.
6. Read the instructions given in OMR carefully.
7. Rough Work is to be done in the end of this booklet.
8. If you write your name 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, you will render yourself liable to disqualification.
9. You have to return the OMR Answer Sheet to the invigilators at the end of the examination compulsorily and must NOT carry it with you outside the Examination Hall.
10. You can take away question booklet and carbon copy of OMR Answer Sheet after the examination.
11. **Use only Blue/Black Ball point pen.**
12. **Use of any calculator, electronic gadgets or log table etc., is prohibited.**
13. **There is no negative marks for incorrect answers.**
14. **In case of any discrepancy found in the Kannada translation of a question booklet the question in English version shall be taken as final.**

COMPUTER SCIENCE AND APPLICATIONS

Paper – II

Note : This paper contains **hundred (100)** objective type questions. **Each** question carries **two (2)** marks. **All** questions are **compulsory**.

1. _____ is the logical translation of the statement, "None of the solutions are correct".

(A) $\exists x(S(x) \wedge \neg C(x))$

(B) $\exists x(\neg S(x) \wedge C(x))$

(C) $\exists x(\neg S(x) \wedge \neg C(x))$

(D) $\neg \exists x(S(x) \wedge C(x))$

2. State the rule of inference used in the statement, "It is foggy and cloudy now, therefore it is foggy now".

(A) Addition

(B) Simplification

(C) Resolution

(D) Conjunction

3. The bit string for the set {2, 4, 6, 8, 10} with universal set of natural numbers less than or equal to 10 is

(A) 0101010101

(B) 1010101010

(C) 1010010101

(D) 0010010101

4. Out of 7 boys and 4 girls, how many queues of 3 boys and 2 girls can be formed ?

(A) 220

(B) 25200

(C) 23400

(D) 500

5. Which one of the following languages over the alphabet {0, 1} is described by the regular expression (0+1)*0(0+1)*0(0+1)* ?

(A) The set of all strings containing the substring 00

(B) The set of all strings containing at most two 0's

(C) The set of all strings containing at least two 0's

(D) The set of all strings that begin and end with either 0 or 1

6. Let set S = {1, ω, ω^2}, where ω, ω^2 are cube roots of unity. If * is the multiplication operation, the structure (S, *) represents

(A) a group

(B) a ring

(C) an integral domain

(D) a field

7. A graph is said to be bipartite when it is

(A) Divided into two independent sets A and B such that each edge connects a vertex from A to B

(B) Connected and it has odd number of vertices

(C) Disconnected

(D) It has n/2 vertices, the degree of each of which is greater than n/2

8. Canonical Product of Sum (POS) for the Boolean function $F = A\overline{B} + \overline{C}\,\overline{D}$ is

(A) Π(M1, M2, M3, M5, M6, M7, M13, M14, M15)

(B) Π(M0, M4, M8, M9, M10, M11, M12)

(C) Π(M0, M4, M6, M7, M10, M11, M12)

(D) Π(M1, M2, M3, M5, M8, M9, M13, M14, M15)

9. The IEEE-754 standard with 32-bit single-precision format uses 1 bit for sign, 8 bits for biased exponent and 23 bits for mantissa to represent a float type variable. If a float type variable X is assigned the decimal value of 9.625, then the representation of X in hexadecimal notation is

(A) 411B0000

(B) 401B0000

(C) 401A0000

(D) 411A0000

10. Which of the following is an invalid register transfer statement ?

(A) wT : R3 ← R1 + R2

(B) xT : R1 ← R1 + R2

(C) yT : R2 ← R1, R1 ← R2

(D) zT : R1 ← R2; R1 ← R3

11. Which of the following is not a valid arithmetic instruction in 8085 ?

(A) SBI

(B) SUI

(C) AXI

(D) LXI

12. The 8085 microprocessor responds to the presence of an interrupt

(A) As soon as the TRAP pin becomes 'LOW'

(B) By checking the TRAP pin for 'high' status at the end of each instruction fetch

(C) By checking the TRAP pin for 'high' status at the end of the execution of each instruction

(D) By checking the TRAP pin for 'high' status at regular intervals

13. The contents of the registers DX, AX and the Carry flag after the execution of the following instructions are

```
MOV AX, 4823H
MOV BX, 100H
MUL BX
```

(A) DX = 0048H, AX = 2300H, CF = 1

(B) DX = 0048H, AX = 4823H, CF = 1

(C) DX = 4800H, AX = 2300H, CF = 1

(D) DX = 4800H, AX = 4823H, CF = 1

14. Choose the correct statement from the below mentioned options for microprocessor in I/O mapped I/O mode.

(A) Memory space available is greater

(B) Not all data transfer instructions are available

(C) I/O and memory space are distinct

(D) I/O mapped I/O space is greater than memory mapped I/O space

15. Which of the following statement is correct with respect to multiprocessor system ?

(A) In a loosely coupled multiprocessor, all the processors share a common memory module

(B) In a tightly coupled multiprocessor, memory is distributed across all the processors

(C) In loosely coupled multiprocessor system, data rate is low rather than tightly coupled multiprocessor system

(D) In a tightly coupled multiprocessor, processors communicate between each other through message passing

16. Which of the following statement is false ?

(A) CISC architecture is based on hardwired control unit

(B) In micro-programmed approach, the control signals are generated by machine instructions

(C) Hardwired control is faster than micro-programmed control

(D) Horizontal micro-programmed control unit is used in parallel processing applications

17. Which flag of the 8085's flag register is not accessible to programmer directly ?

(A) Zero flag

(B) Carry flag

(C) Auxiliary carry flag

(D) Parity flag

18. The number of different Boolean functions that can be generated by n variables is equal to

(A) $2^{2^{n-1}}$ (B) 2^{2^n}

(C) 2^n (D) 2^{n-1}

19. A direct mapped cache memory of size 1MB with block size 2KB has 9 bits in the tag. The size of main memory is

(A) 512 MB (B) 128 MB

(C) 64 MB (D) 32 MB

20. Consider a CPU which has 32-bit instructions. A program is stored at memory location with the starting address 0050H. Which one of the following is a valid program counter value ?

(A) 0191H (B) 0192H

(C) 0193H (D) 0194H

21. If x and y are non-zero positive integers, the following pseudocode computes

```
while (x!=y)
{
        if(x > y)
                x = x – y
        else
                y = y – x
}
display(x)
```

(A) GCD of x and y

(B) LCM of x and y

(C) Largest of x and y

(D) Smallest of x and y

22. The output of C statement printf("%d", printf("Bangalore")); is

(A) Results in a syntax error

(B) Displays Bangalore9

(C) Displays garbage value

(D) Displays Bangalore twice

23. The output of the below C program segment is

```
for(i = 1; i < 5; i++)
{
        if(i < 4) continue;
                printf("%d", i);
}
```

(A) 1 2 3 4 5

(B) 1 2 3

(C) 4

(D) 4 5

24. What is the output of the following C program segment ?

```
int main(void)
{
    char names [2][20] = {"Chandrashekar", "Ramamurthy"};
    putchar(**names);
    return 0;
}
```

(A) Compilation error

(B) Runtime error

(C) Prints garbage value

(D) Prints C

25. If cp is a pointer to char type, sizeof (cp) in a 32-bit machine is

(A) 1 byte

(B) 2 bytes

(C) 3 bytes

(D) 4 bytes

26. The output of the following C code segment is

```
int a, *ap, **app;
a = 10;
ap = &a;
app = &ap;
printf("%d", **app);
```

(A) Address of a

(B) Address of ap

(C) Address of app

(D) 10

27. What is the output of the following C++ program segment ?

```
int main(void)
{
    int a = 10;
    int &p = a;
    cout << &p;
    return 0;
}
```

(A) Address of a

(B) Compiler error

(C) Value of a

(D) Runtime error

28. Choose the best answer.

A function that does the same operation on different types of data is implemented using

(A) Macro
(B) Function overloading
(C) Function template
(D) Function with default arguments

29. Consider the following C++ code.

```
int x(int m)
{
        m = m – 1;
        return m;
}
int y(int n)
{
        return(++n);
}
int main(void)
{
        int 1 = 5;
        1 + = x(y(1));
        cout <<1;
        return 0;
}
```

The output of the above program is

(A) 11
(B) 5
(C) 10
(D) 15

30. The output of the following Java program is

```
class test
{
    public static void main(String args[])
    {
        int x, y;
        x = 11 & 9;
        y = x^3;
        System.out.println(y|12);
    }
```

(A) 12
(B) 13
(C) 14
(D) 15

31. A thread can be initiated with _____ method.

(A) run()
(B) start()
(C) begin()
(D) create()

32. A cube of side 1 unit is placed in such a way that the origin coincides with one of its vertices and the three axes run along three of its edges. The vertex diagonally opposite to (1, 0, 1) is

(A) (0, 0, 0)
(B) (1, 1, 0)
(C) (0, 1, 1)
(D) (0, 1, 0)

33. Hue of a colour is related to its

(A) Luminance

(B) Saturation

(C) Incandescence

(D) Wavelength

34. In which stage of database design, all the necessary fields and their types of a database are listed ?

(A) Data definition

(B) Data field definition

(C) E-R diagram

(D) User definition

35. Database table by name Loan_Records is given below :

Borrower	Bank_ Manager	Loan_ Amount
Rasika	Praveen	10,000.00
Karuna	Kushal	5,000.00
Rajeshwari	Praveen	7,000.00

What is the output of the following SQL query ?

SELECT count(*) FROM ((SELECT Borrower, Bank_Manager FROM Loan_Records) AS S NATURAL JOIN (SELECT Bank_Manager, Loan_Amount FROM Loan_Records)AS T);

(A) 3

(B) 9

(C) 5

(D) 6

36. A transaction that inserts a new tuple into a database is given

(A) Exclusive lock

(B) Shared lock

(C) Mutual lock

(D) No lock

37. The reliability of a system with n redundant components each having a reliability of r is

(A) $(1 + r)^n$ (B) $1 – (1 – r)^n$

(C) $1 – (1 + r)^n$ (D) $1 + (1 – r)^n$

38. Consider the schedule : T1 : R(X); T2 : R(Y); T3 : W(X); T2 : R(X); T1 : R(Y). The schedule T1 is

(A) Not conflict and not view serializable

(B) Conflict and view serializable

(C) Not conflict, but view serializable

(D) Conflict, but not view serializable

39. Consider the following commands :

CREATE TABLE DEPT(DeptNo int PRIMARY KEY, DName varchar (30));

CREATE TABLE EMP(EmpNo int PRIMARY KEY, EmpName varchar(30), DeptNo int references DEPT(DeptNo));

Which of the following operations may cause violation of referential integrity constraint ?

(A) delete on EMP

(B) insert into DEPT

(C) update on DEPT

(D) both (A) and (B)

40. Consider two sets A and B. Element in each set is a positive integer. These sets are represented as bit vector i.e. k^{th} bit set to 1 if number k belongs to set. For example, A = {0, 1, 3, 4, 7}; bit vector representation shall be 10011011 (LSB corresponds to number 0). In such representation, A – B can be computed using

(A) A AND B

(B) A XOR B

(C) A OR B

(D) A AND (NOT (B))

41. Information in GIS is entered and stored as

(A) Panels

(B) Layers

(C) Single panel

(D) Dual panel

42. Which of the following is heterogeneous distributed database ?

(A) The same DBMS is used at each location and data are not distributed across all nodes

(B) The same DBMS is used at each location and data are distributed across all nodes

(C) Different DBMSes are used at each location and data are not distributed across all nodes

(D) Different DBMSes are used at each location and data are distributed across all nodes

43. Which of the following is true about the three-tier data warehouses ?

(A) Once created, the data marts will keep on being updated from the data warehouse at periodic times

(B) Once created, the data marts will directly receive their new data from the operational databases

(C) The data marts are different groups of tables in the data warehouse

(D) A data mart becomes a data warehouse when it reaches a critical size

44. Web Mining is not used in which of the following areas ?

(A) Online transaction processing

(B) Information filtering

(C) Click stream analysis

(D) Crime fighting on the internet

45. Which technology is used to store data in hadoop ?

(A) HBase

(B) Avro

(C) Sqoop

(D) Zookeepr

46. Object Definition Language (ODL) supports _____ operators.

(A) unary

(B) unary and binary

(C) unary and binary and ternary

(D) unary and binary and ternary and higher

47. Storage mapping is done by
(A) Linker
(B) Compiler
(C) Loader
(D) Operating system

48. Compiler can check
(A) Both logical and syntax error
(B) Logical error
(C) Syntax error
(D) Runtime-errror

49. A loader is a
(A) Program that automates the translation of assembly language into machine language
(B) Program that places programs into memory and prepares them for execution
(C) Program that accepts a high level language program and produces its object program equivalent
(D) Program that translate byte code into machine code

50. CPU generates 32-bit virtual addresses. The page size is 4 k bytes. The processor has a Transition Look-aside Buffer (TLB) which can hold a total of 128 page table entries and is 4-way set associative. The minimum size of the TLB tag is
(A) 11 bits
(B) 13 bits
(C) 15 bits
(D) 20 bits

51. Assume that there are 3 page frames which are initially empty. If the page reference string is 1, 2, 3, 4, 2, 1, 5, 3, 2, 4, 6 then, the number of page faults using the optimal replacement policy is
(A) 5
(B) 7
(C) 10
(D) 0

52. In a system with 32-bit virtual addresses and 1-KB page size, use of one-level page tables for virtual to physical address translation is not practical because of
(A) The large amount of internal fragmentation
(B) The large amount of external fragmentation
(C) The large computation overhead in the translation process
(D) The large memory overhead in maintaining page tables

53. A computer system supports 32-bit virtual addresses as well as 32-bit physical addresses. Since the virtual address space is of the same size as the physical address space, the operating system designers decide to get rid of the virtual memory entirely. Which one of the following is true ?
(A) Efficient implementation of multi-user support is no longer possible
(B) The processor cache organization can be made more efficient now
(C) Hardware support for memory management is no longer needed
(D) CPU scheduling can be made more efficient now

54. Threads of a process share

(A) Global variables but not heap

(B) Heap but not global variables

(C) Neither global variables nor heap

(D) Both heap and global variables

55. What is the purpose of the touch command in Linux ?

(A) It creates a new empty file

(B) It displays the contents of a file

(C) It updates the timestamp of an already existing file

(D) It makes a new directory

56. Which testing is the re-execution of some subset of tests that have already been conducted to ensure the changes that are not propagated ?

(A) Unit testing

(B) Regression testing

(C) Integration testing

(D) Thread-based testing

57. The Incremental Model is a result of combination of elements of which two models ?

(A) Build and FIX Model and Waterfall Model

(B) Linear Model and RAD Model

(C) Linear Model and Prototyping Model

(D) Waterfall Model and RAD Model

58. Identify the correct statement with respect to Evolutionary development.

(A) Evolutionary development usually has two flavours; exploratory development and throw-away prototyping

(B) Very large projects are usually done using evolutionary development based approach

(C) It facilitates easy project management, through the high volume of documentation it generates

(D) Sometimes the construction of a throw-away prototype is not followed by a re-implementation of the software system using a more structured approach

59. Elements of which of the following data structures are stored/accessed in non-linear order ?

(A) Stack

(B) Queue

(C) Tree

(D) Linked list

60. A1, A2, A3 and A4 are the four algorithms to solve the same problem and their efficiency classes are log(n), log(log(n)), nlog(n) and n^2 respectively. Which is the second best algorithm ?

(A) A1

(B) A2

(C) A3

(D) A4

61. The solution of the recurrence relation $T(n) = T(n-1) + n + 1$ with the base condition $T(1) = 0$ ends up with the efficiency class

(A) log(n) (B) n^2

(C) n (D) nlog(n)

62. The worst case efficiency of quick sort algorithm is

(A) $O(n^2)$

(B) O(n)

(C) O(log(n))

(D) O(nlog(n))

63. The efficiency of DFS algorithm when the graph with $|V|$ vertices and $|E|$ edges is represented using adjacency matrix is

(A) $|V|^2$

(B) $|V| + |E|$

(C) $|E|^2$

(D) $\log(|V| + |E|)$

64. The time efficiency class of heap sort in the worst case is

(A) n^2 (B) nlog(n)

(C) n (D) log(n)

65. Consider $P(x) = a_n x^n + a_{n-1}x^{n-1} + a_{n-2}x^{n-2} + \ldots + a_2x^2 + a_1x + a_0$.
The algorithm to evaluate the above polynomial from right to left, given the values of the co-efficients $a_n, a_{n-1}, \ldots, a_0$ and the value of x, has the efficiency class

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

(C) n (D) log(n)

66. The efficiency of Horspool's algorithm for random texts in the average case is _____, where n and m are the lengths of text and pattern respectively.

(A) O(n) (B) $O(n^2)$

(C) O(n + m) (D) O(mn)

67. n-queens problem is solved using

(A) Branch and bound technique

(B) Backtracking technique

(C) Greedy technique

(D) Dynamic programming

68. Which strategy is used in KMP String matching algorithm ?

(A) Divide and conquer

(B) Greedy

(C) Trading space for time

(D) Backtracking

69. The basic limitation of a FSM is that

(A) It cannot remember arbitrary large amount of information

(B) It sometimes recognizes grammars that are not regular

(C) It sometimes fails to recognize grammars that are regular

(D) It can remember arbitrary large amount of information

70. Finite state machine _____ recognize palindromes.

(A) can (B) cannot

(C) may (D) may not

71. Which of the following is true while converting CFG to LL(1) grammar ?

(A) Remove left recursion

(B) Factoring grammar

(C) Both (A) and (B)

(D) Only (A)

72. Let L be a set accepted by a non deterministic finite automaton having Q states. The maximum number of states in equivalent finite automaton that accepts L is

(A) $|Q|$ (B) $2|Q|$

(C) $2^{|Q|-1}$ (D) $2^{|Q|}$

73. The grammar $A \rightarrow AA \mid (A) \mid \varepsilon$ is not suitable for predictive-parsing because the grammar is

(A) Ambiguous

(B) Left-recursive

(C) Right-recursive

(D) An operator-grammar

74. Consider the translation scheme shown below.

$S \rightarrow T\ R$

$R \rightarrow + T$ {print('+');} $R \mid \varepsilon$

$T \rightarrow$ num {print(num.val);}

Here num is a token that represents an integer and num.val represents the corresponding integer value. For an input string '9 + 5 + 2', this translation scheme will print

(A) 9 + 5 +2 (B) 9 5 + 2 +

(C) 9 5 2 + + (D) + + 9 5 2

75. One of the purposes of using intermediate code in compilers is to

(A) Make parsing and semantic analysis simpler

(B) Improve error recovery and error reporting

(C) Increase the chances of reusing the machine-independent code optimizer in other compilers

(D) Improve the register allocation

76. A regular grammar for the language $L = \{a^n b^m \mid n \text{ is even and } m \text{ is even}\}$ is given by

(A) $S \rightarrow aSb \mid S1;\ S1 \rightarrow bS1a \mid \lambda$

(B) $S \rightarrow aaS \mid S1;\ S1 \rightarrow bSb \mid \lambda$

(C) $S \rightarrow aSb \mid S1;\ S1 \rightarrow S1ab \mid \lambda$

(D) $S \rightarrow aaS \mid S1;\ S1 \rightarrow bbS1 \mid \lambda$

77. Six channels, each with a 250 kHz bandwidth, are to be multiplexed together. If there is a need for a guard band of 50 kHz between the channels to prevent interference, the minimum bandwidth of the link should be

(A) 1700 kHz

(B) 1750 kHz

(C) 1650 kHz

(D) 1800 kHz

78. If the hamming distance between the data word and the corresponding code word is 5 then _____ numbers of bits are corrupted during transmission.

(A) 2 (B) 4

(C) 5 (D) 6

79. If the _____ is too much, the receiver may not be able to detect the signal at all or may fall below the noise level.

(A) noise

(B) delay

(C) distortion

(D) attenuation

80. Which of the following is not a closed loop congestion control mechanism ?

(A) Backpressure

(B) Retransmission policy

(C) Implicit signaling

(D) Explicit signaling

81. An Internet Service Provider (ISP) has the following chunk of CIDR-based IP addresses available with it 218.14.192.0/22. The ISP wants to give half of this chunk of addresses to Organization A and a quarter to Organization B, while retaining the remaining with it. Which of the following is a valid prefix length for Organization A and Organization B ?

(A) 23 and 24 (B) 20 and 21

(C) 22 and 22 (D) 22 and 23

82. Consider a system using Selective Repeat protocol with sender window size $SW_S = 8$. Given that every 5^{th} packet is lost during the transmission. If total number of packets to be sent is 17, then how many transmissions will be required ?

(A) 21

(B) 20

(C) 26

(D) 29

83. An IP router with a Maximum Transmission Unit (MTU) of 320 bytes has received an IP packet of size 980 bytes which includes header of length 20 bytes. The identification field value for the first packet is 100. The offset and identification value for the last fragment will be

(A) 111, 103

(B) 900, 100

(C) 111, 100

(D) 900, 103

84. What is the maximum number of IP addresses that can be assigned to hosts on a local subnet that uses the 255.255.255.192 subnet mask ?

(A) 62

(B) 30

(C) 32

(D) 64

85. Using public key cryptography, X adds a digital signature σ to message M, encrypts <M, σ> and sends it to Y, where it is decrypted. Which one of the following sequences of keys is used for the operations ?

(A) Encryption : X's private key followed by Y's private key; Decryption : X's public key followed by Y's public key;

(B) Encryption : X's private key followed by Y's public key; Decryption : X's public key followed by Y's private key;

(C) Encryption : X's public key followed by Y's private key; Decryption : Y's public key followed by X's private key;

(D) Encryption : X's private key followed by Y's public key; Decryption : Y's private key followed by X's public key;

86. Which of the following is the type of software that has self-replicating software that causes damage to files and system ?

(A) Viruses (B) Trojan horses

(C) Bots (D) Worms

87. Which of the following is not part of switching system in GSM network ?

(A) Home Location Register (HLR)

(B) Equipment Identity Register (EIR)

(C) Authentication Centre (AC)

(D) Base Transceiver Station (BTS)

88. _____ describes a distribution model in cloud computing in which applications are hosted by a service provider and made available to users.

(A) Infrastructure-as-a-Service (IaaS)

(B) Platform-as-a-Service (PaaS)

(C) Software-as-a-Service (SaaS)

(D) Cloud service

89. Suppose that a group contains 7 members. Each member of the group wants to communicate secretly with the others using symmetric key cryptographic system. The communication between any two persons should not be decodable by the others in the group. The number of keys required in the system as a whole to satisfy the confidentiality requirement is

(A) 21

(B) 14

(C) 42

(D) 49

90. Which of the following is not a characteristic of 3G network ?

(A) Communication over VoIP

(B) Multi-megabit internet access

(C) Greater security features

(D) LTE based network

91. An agent is composed of

(A) Architecture

(B) Agent function

(C) Perception sequence

(D) Architecture and program

92. A problem in search space is defined by
(A) Initial state
(B) Goal test
(C) Intermediate state
(D) Both (A) and (B)

93. How many successors are generated in backtracking search ?
(A) 1 (B) 2
(C) 3 (D) 4

94. The first neural network computer is
(A) RFD (B) SNARC
(C) AM (D) AN

95. In LISP addition 3 + 2 is entered as
(A) 3 + 2 (B) 3 add 2
(C) 3 + 2 = (D) (+3 2)

96. YACC stands for
(A) Yet Accept Compiler Constructs
(B) Yet Accept Compiler Compiler
(C) Yet Another Compiler Construct
(D) Yet Another Compiler Compiler

97. A set generated using infinite-value membership function is known as
(A) Crisp set
(B) Boolean set
(C) Fuzzy set
(D) All the above

98. Context free languages are closed under
(A) Union, intersection
(B) Union, Kleene closure
(C) Intersection, complement
(D) Complement, Kleene closure

99. The efficiency class of binary search in the best case is
(A) n/2 (B) log(n)
(C) constant (D) nlog(n)

100. Output of the following C++ program is

```
class A
{
    protected : int i;
    A(){ i = 10; }
    void display() { cout <<i; }
};
class B : public A
{
    private : int j;
    B() : A() { j = 20; }
    void display() { cout <<i<<j; }
};
int main(void)
{
    A a;
    B b; a = b; a.display();return 0;
}
```

(A) 20 (B) 10
(C) 10 20 (D) 20 10

Space for Rough Work