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FOR KSET PREPARATION

KSET 2023 Computer Science and Applications Question Paper

EXAM	YEAR	TYPE
KSET	2023	Question Paper

ಕ್ರಮ ಸಂಖ್ಯೆ.

K-SET

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ಸ್ಪರ್ಧಾತ್ಮಕ ಪರೀಕ್ಷೆ- 2023

ಪತ್ರಿಕೆ – II

ವರ್ಷನ್ ಸಂಕೇತ

B1

ವಿಷಯ: ಗಣಕ ವಿಜ್ಞಾನ ಮತ್ತು ಅನ್ವಯ

ವಿಷಯ ಸಂಕೇತ:24

ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆ ಸಂಕೇತ	ಅವಧಿ	ಒಟ್ಟು ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ	ಗರಿಷ್ಠ ಅಂಕಗಳು	ನಿಮ್ಮ ನೋಂದಣಿ ಸಂಖ್ಯೆಯನ್ನು ನಮೂದಿಸಿ						
COP202324	ಎರಡು ಘಂಟೆಗಳು	100	200							

ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಸೂಚನೆಗಳು

ಮಾಡಿ:

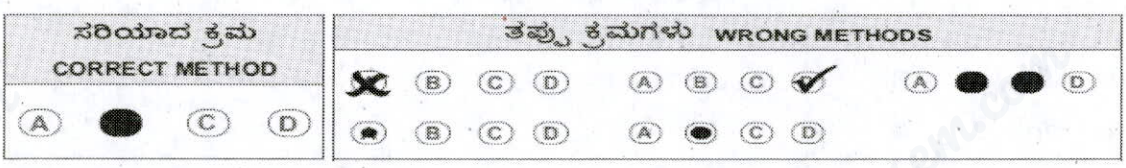
1. ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರು ಈ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯನ್ನು ನಿಮಗೆ ಎರಡನೇ ಬೆಲ್ ಆದ ನಂತರ ಕೊಡುತ್ತಾರೆ.
2. ನೊಂದಣಿ ಸಂಖ್ಯೆಯನ್ನು ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಬರೆದು ಅದಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ವೃತ್ತಗಳನ್ನು ಸಂಪೂರ್ಣವಾಗಿ ತುಂಬಿದ್ದೀರೆಂದು ಖಾತ್ರಿಪಡಿಸಿಕೊಳ್ಳತಕ್ಕದ್ದು.
3. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ವರ್ಷನ್ ಕೋಡ್ ಅನ್ನು ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಬರೆದು ಅದಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ವೃತ್ತಗಳನ್ನು ಸಂಪೂರ್ಣವಾಗಿ ತುಂಬಬೇಕು.
4. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ವರ್ಷನ್ ಕೋಡ್ ಮತ್ತು ಕ್ರಮ ಸಂಖ್ಯೆಯನ್ನು ನಾಮಿನಲ್ ರೋಲ್‌ನಲ್ಲಿ ತಪ್ಪಿಲ್ಲದೆ ಬರೆಯಬೇಕು.
5. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯ ಕೆಳಭಾಗದ ನಿಗದಿತ ಜಾಗದಲ್ಲಿ ಕಡ್ಡಾಯವಾಗಿ ಸಹಿ ಮಾಡಬೇಕು.

ಮಾಡಬೇಡಿ:

1. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಮುದ್ರಿತವಾಗಿರುವ **ಟೈಮಿಂಗ್** & **ಮಾರ್ಕನ್ನು** ತಿದ್ದಬಾರದು / ಹಾಳುಮಾಡಬಾರದು / ಅಳಿಸಬಾರದು.
2. ಮೂರನೇ ಬೆಲ್ ಆಗುವವರೆಗೂ,
   - ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಬಲಭಾಗದಲ್ಲಿರುವ ಸೀಲ್ ಅನ್ನು ತೆಗೆಯಬಾರದು.
   - ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಒಳಗಡೆ ಇರುವ ಪ್ರಶ್ನೆಗಳನ್ನು ನೋಡಲು ಪ್ರಯತ್ನಿಸಬಾರದು ಮತ್ತು ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಉತ್ತರಿಸಲು ಪ್ರಾರಂಭಿಸಬಾರದು.

ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಮುಖ್ಯ ಸೂಚನೆಗಳು

1. ಪ್ರಶ್ನೆಗಳಲ್ಲಿ ಬಳಸಿರುವ signs and symbols ಗಳನ್ನು, ಬೇರೆ ರೀತಿಯಲ್ಲಿ ಹೇಳದ ಹೊರತು, ನಿಗದಿತ ಪಠ್ಯಪುಸ್ತಕದಲ್ಲಿನ ಅರ್ಥವನ್ನು ಪರಿಗಣಿಸಬೇಕು.
2. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿ ಒಟ್ಟು **100** ಪ್ರಶ್ನೆಗಳಿದ್ದು, ಪ್ರತಿ ಪ್ರಶ್ನೆಗೂ 4 ಬಹು ಆಯ್ಕೆ ಉತ್ತರಗಳು ಇರುತ್ತವೆ. ಪ್ರತಿ ಪ್ರಶ್ನೆಯ ಕೆಳಗೆ ಕೊಟ್ಟಿರುವ ನಾಲ್ಕು ಬಹು ಆಯ್ಕೆಯ ಉತ್ತರಗಳಲ್ಲಿ ಸರಿಯಾದ ಒಂದು ಉತ್ತರವನ್ನು ಆಯ್ಕೆ ಮಾಡಿ.
3. ಮೂರನೇ ಬೆಲ್ ಆದ ನಂತರ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಬಲಭಾಗದಲ್ಲಿರುವ ಸೀಲ್ ತೆಗೆದು ಈ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿ ಯಾವುದೇ ಪುಟಗಳು ಮುದ್ರಿತವಾಗಿಲ್ಲದೇ ಇರುವುದು ಕಂಡು ಬಂದಲ್ಲಿ ಅಥವಾ ಹರಿದು ಹೋಗಿದ್ದಲ್ಲಿ ಅಥವಾ ಯಾವುದೇ ಅಕ್ಷರಗಳು ಬಿಟ್ಟುಹೋಗಿದ್ದಲ್ಲಿ ಎಂಬುದನ್ನು ಖಚಿತಪಡಿಸಿಕೊಂಡು, ಈ ರೀತಿ ಆಗಿದ್ದರೆ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು ಬದಲಾಯಿಸಿ ಕೊಳ್ಳುವುದು. ನಂತರ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಉತ್ತರಿಸಲು ಪ್ರಾರಂಭಿಸುವುದು.
4. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿನ ಪ್ರಶ್ನೆಗೆ ಅನುಗುಣವಾಗಿರುವ ಸರಿ ಉತ್ತರವನ್ನು ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಅದೇ ಕ್ರಮ ಸಂಖ್ಯೆಯ ಮುಂದೆ ನೀಡಿರುವ ಸಂಬಂಧಿಸಿದ ವೃತ್ತವನ್ನು ನೀಲಿ ಅಥವಾ ಕಪ್ಪು ಬಾಲ್ ಪಾಯಿಂಟ್ ಪೆನ್‌ನಿಂದ ಸಂಪೂರ್ಣ ತುಂಬುವುದು.



5. ಈ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯನ್ನು ಸ್ಕ್ಯಾನ್ ಮಾಡುವ ಸ್ಕ್ಯಾನರ್ ಬಹಳ ಸೂಕ್ಷ್ಮವಾಗಿದ್ದು ಸಣ್ಣ ಗುರುತನ್ನು ಸಹ ದಾಖಲಿಸುತ್ತದೆ. ಆದ್ದರಿಂದ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಉತ್ತರಿಸುವಾಗ ಎಚ್ಚರಿಕೆ ವಹಿಸಿ.
6. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿ ಕೊಟ್ಟಿರುವ ಖಾಲಿ ಜಾಗವನ್ನು ರಫ್ ಕೆಲಸಕ್ಕೆ ಉಪಯೋಗಿಸಿ. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯನ್ನು ಇದಕ್ಕೆ ಉಪಯೋಗಿಸಬೇಡಿ.
7. **ಕೊನೆಯ ಬೆಲ್ ಆದ ನಂತರ ಉತ್ತರಿಸುವುದನ್ನು ನಿಲ್ಲಿಸಿ, ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯನ್ನು ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರಿಗೆ ಯಥಾಸ್ಥಿತಿಯಲ್ಲಿ ನೀಡಿರಿ.**
8. ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರು ಮೇಲ್ಭಾಗದ ಹಾಳೆಯನ್ನು ಪ್ರತ್ಯೇಕಿಸಿ (ಕಚೇರಿ ಪ್ರತಿ) ತಮ್ಮ ವಶದಲ್ಲಿ ಇಟ್ಟುಕೊಂಡು ತಳಬದಿಯ ಯಥಾಪ್ರತಿಯನ್ನು (ಅಭ್ಯರ್ಥಿಯ ಪ್ರತಿ) ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಕೊಡುತ್ತಾರೆ.
9. ಎಲ್ಲಾ ಪ್ರಶ್ನೆಗಳಿಗೆ ಸಮಾನ ಅಂಕಗಳಿರುತ್ತದೆ. ಋಣಾತ್ಮಕ ಮೌಲ್ಯಮಾಪನವಿರುವುದಿಲ್ಲ.
10. ಯಾವುದೇ ರೀತಿಯ ಮೊಬೈಲ್ ಫೋನ್, ಕ್ಯಾಲ್ಕ್ಯುಲೇಟರ್ ಮತ್ತು ಇತರೆ ರೀತಿಯ ಎಲೆಕ್ಟ್ರಾನಿಕ್/ಕಮ್ಯುನಿಕೇಷನ್ ಸಾಧನಗಳು ಇತ್ಯಾದಿಗಳನ್ನು ಪರೀಕ್ಷಾ ಕೇಂದ್ರದ ಅವರಣದೊಳಗೆ ತರುವುದನ್ನು ನಿಷೇಧಿಸಿದೆ.

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1. What will be the output after execution of the following statements ?

```
# include < stdio.h >
int main ()
{
    int i = 065  j = 65;
    printf ("%d %d", i, j);
    return 0;
}
```

(A) 065 65

(B) 53 65

(C) 65 65

(D) Syntax error

2. Read the code and predict the value of x.

```
# include < stdio.h >
int main ()
{
    int x;
    x = 5 > 8 ? 10 : 1! = 2 < 5 ? 20 : 30;
    printf ("%d", x);
    return 0;
}
```

(A) 20

(B) 30

(C) 8

(D) 10

Space for Rough Work

3. What is the output of the following C code ?

```
int main ()
{
    int ary [ ] = { 1, 3, 5 };
    printf ("%d %d", ary [-1], ary [4] );
    return 0;
}
```

(A) 1 5 (B) 0 0 (C) Compile error (D) Garbage value

4. Predict the output of the following C++ code.

```
# include < iostream >
  using namespace std;
  template < typename T >
 T max (T & P, T & q)
    {
        return ( p > q ? p : q );
    }
int main ()
{
    int x = 55, y = 60, m;
    long a = 105, b = 53, n;
    m = max (x, y);
    n = max (a, b);
    cout << m << endl;
    cout << n << endl;
    return 0;
}
```

(A) 60 60 (B) 60 105 (C) 50 105 (D) 60 53

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5. Which of the following can be considered as the correct syntax for declaring an array of pointers of integers that has a size of 20 in C++ ?

(A) int arr = new int [20];

(B) int *arr = new int * [20];

(C) int **arr = new int * [20];

(D) int *arr = new int [20];

6. Which of the following tag is used for inserting the largest heading in HTML ?

(A) < h3 > (B) < h1 > (C) < h5 > (D) < h6 >

7. Which is ***not*** a method in the life-cycle of Java servlet ?

(A) init () (B) call () (C) service () (D) destroy ()

8. What is the 4-bit code of the bottom region among the nine regions divided using the Cohen-Sutherland algorithm ?

(A) 0000 (B) 0010 (C) 0110 (D) 0101

9. Which of the following algorithm is used to color a pixel if it is not colored and leaves it if it is already filled ?

(A) Boundary Fill Algorithm

(B) Scan-Line Polygon Fill Algorithm

(C) Flood Fill Algorithm

(D) Seed Filling Algorithm

10. In true color RGB, the number of bits for color depth is _____.

(A) 32 (B) 24

(C) 56 (D) 18

Space for Rough Work

11. _____ translates the DML statements embedded in an application program to normal procedure calls in the host language.

(A) DDL Compiler

(B) DML Pre-complier

(C) DML Compiler

(D) DDL Interpreter

12. Identify the correctness of the following statements :

I. The aggregate functions like sum, count, etc., can be performed with the basic relational algebraic operations of relational calculus formulas.

II. Relational calculus is a formal query language where the queries are expressed as variables and formulas on these variables.

III. The queries in the relational algebra are procedural.

(A) I is correct; II and III are incorrect

(B) I is incorrect; II and III are correct

(C) I and II are correct; III is incorrect

(D) I and II are incorrect; III is correct

13. Which one of the following statements is false ?

(A) Triggers prevent invalid transactions

(B) Triggers does not provide transparent event logging

(C) Triggers provide transparent event logging

(D) Triggers provide complex security authorization

14. Which one of the following is ***not*** a desirable property of transaction ?

(A) Atomicity (B) Consistency

(C) Durability (D) Normalization

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15. Identify the correctness of the statements :

I. Object-Relational Databases are schema-less

II. Object-Relational Databases store objects as rows in tables

III. Object-Relational Databases make use of pessimistic and optimistic locking

(A) I is correct; II and III are incorrect

(B) I is incorrect; II and III are correct

(C) I and II are correct; III is incorrect

(D) I and II are incorrect; III is correct

16. A clustering index is defined on the fields, are of the type :

(A) Non-key and ordering

(B) Non-key and non-ordering

(C) Key and ordering

(D) Key and non-ordering

17. The system of data warehousing is mostly used for :

(A) Data mining and data storage

(B) Data integration and data storage

(C) Reporting and data analysis

(D) Data cleaning and data storage

18. The process of data scrubbing deals with the process to :

(A) Upgrade the quality of data after it is moved into a data warehouse.

(B) Reject data from the data warehouse and to create the necessary indexes.

(C) Load data into data warehouse and to create necessary indexes.

(D) Clean and upgrade the quality of data, before it is moved into a data warehouse.

Space for Rough Work

19. Which of the following statement(s) is/are true ?

I. Facebook has the world's largest Hadoop cluster

II. Hadoop 2.0 allows live stream processing of real-time data.

(A) I only (B) II only

(C) Both I and II (D) Neither I nor II

20. Which of the following is a NoSQL type ?

(A) SQL (B) JSON

(C) Document database (D) Image database

21. _____ translates the high-level language program into machine language.

(A) Assembler (B) Compiler

(C) Loader (D) Linker

22. _____ is invoked when there is a need to perform process scheduling, that is when a process from the ready queue is to be selected for dispatching to the CPU.

(A) Long-Term Scheduler

(B) Medium-Term Scheduler

(C) Short-Term Scheduler

(D) Non-preemptive Scheduler

23. A thread is a _____.

(A) Task (B) Process

(C) Lightweight process (D) Program

24. Which one of the following is ***not*** a deadlock recovery method ?

(A) Resource preemption (B) Abort the process

(C) Hold and wait (D) Rollback

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25. _____ helps to control memory wastage occurring in dynamic partitioning.

(A) Fragmentation (B) Compaction

(C) Garbage collection (D) Segmentation

26. RAID level 4 provides :

(A) Disk mirroring

(B) Memory style error-correcting code organization

(C) Block-interleaved parity organization

(D) Bit-interleaved parity organization

27. _____ is a general model of protection that provides a mechanism for protection without imposing a particular protection policy on the system or its users.

(A) Global table (B) Capability list

(C) Lock-key mechanism (D) Access matrix

28. _____ is built into the software by the original programmer in order to gain access to any system without going through the usual security access procedure.

(A) Trojan Horse (B) Logic Bomb

(C) Trap Door (D) Worm

29. A _____ acts as a lightweight operating system that runs natively on the hardware and manages guest operating systems.

(A) Type 0 Hypervisor (B) Type 1 Hypervisor

(C) Type 2 Hypervisor (D) Emulator

30. In a communication network, if a path from Site A to Site B is fixed for the duration of one session, the routing scheme adopted is called _____.

(A) Fixed routing (B) Virtual routing

(C) Dynamic routing (D) Static routing

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31. In the software generic process model, _____ executes the activities in a circular manner.

(A) Linear Process Flow
(B) Iterative Process Flow
(C) Evolutionary Process Flow
(D) Parallel Process Flow

32. _____ defines a problem associated with a framework activity for the process.

(A) Stage Pattern
(B) Task Pattern
(C) Phase Pattern
(D) Pattern Name

33. _____ depicts the information domain for the problem.

(A) Scenario-based Models
(B) Flow-Oriented Models
(C) Class-Oriented Models
(D) Data Models

34. _____ architectural design model addresses the behavioural aspects of the program architecture, indicating how the structure or system configuration may change as a function of external events.

(A) Dynamic
(B) Framework
(C) Process
(D) Functional

35. _____ is an indication of the relative functional strength of a module.

(A) Coupling
(B) Refinement
(C) Aspects
(D) Cohesion

36. The extent to which a program can be expected to perform its intended function with the required precision. This definition belongs to _____ software quality factor.

(A) Correctness
(B) Reliability
(C) Integrity
(D) Usability

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37. The _____ is a dynamic multivariable model that assumes a specific distribution of effort over the life of a software development project.

(A) COCOMO (B) LOC

(C) Software Equation (D) FP

38. _____ is not related to Black-box Testing.

(A) Equivalence Partitioning

(B) Boundary Value Analysis

(C) Orthogonal Array Testing

(D) Condition Testing

39. The _____ is conducted at the developer's site by a representative group of end users.

(A) Alpha Testing (B) Beta Testing

(C) Configuration Review (D) Recovery Testing

40. _____ combines procedures and tools to manage different versions of configuration objects that are created during the software process.

(A) Change Control (B) Version Control

(C) Audit Trail (D) Configuration Audit

41. Which one of the following statements is true in the context of sparse array ?

(A) The matrices having regular non-zero elements are called unstructured non-zero region matrices.

(B) Addition of two sparse matrices is possible even if the order of the two matrices are unequal.

(C) Diagonal matrix and tridiagonal matrix are examples of structured non-zero region matrices.

(D) Non-zero entries that can occur only on the diagonal or on elements immediately above or below the diagonal is called triangular matrix.

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42. Theta notation is used for

(A) Analyzing the maximum time required by an algorithm

(B) Analyzing the average case complexity of an algorithm

(C) Analyzing minimum time required by an algorithm

(D) Specifying the upper bound of a function

43. The maximum number of nodes of binary tree at level "i" is _____.

(A) 2^{i+2} (B) 2^{i+1} (C) 2^{i} (D) i^{2}

44. Which one of the following is ***false*** in the context of Divide and Conquer method ?

(A) It is recursive

(B) It is a top-down approach

(C) It is a bottom-up approach

(D) Subproblems are independent of each other

45. Which one of the following technique is ***not*** used by the Lower Bound theory for calculating lower bound ?

(A) Empirical Analysis

(B) Comparison Trees

(C) State-space method

(D) Oracle and adversary argument

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

(A) NP problems are subset of P problems

(B) NP problems are non-deterministic in nature

(C) Solution to P class problem is easy to find

(D) Solutions to NP problems can be verified in polynomial time

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47. In _____ every even integer greater than 2 can be expressed as the sum of 2 primes.

(A) Fermat's last theorem
(B) Lemoine's conjecture
(C) Lychrel numbers
(D) Goldbach's conjecture

48. Determine whether the following statements are correct :

I. Naive algorithm is based on character comparison.

II. Boyer Moore algorithm makes use of heuristics of Naive and KMP algorithm.

(A) I is correct and II is incorrect

(B) I is incorrect and II is correct

(C) I and II are correct

(D) I and II are incorrect

49. Determine the correct statements from the following :

I. An approximation algorithm guarantees to run in polynomial time.

II. An approximation algorithm does not guarantee the most effective solution.

III. An approximation algorithm provides solution in exponential time.

(A) I and II are incorrect; III is correct

(B) I is correct; II and III are incorrect

(C) I is incorrect; II and III are correct

(D) I and II are correct; III is incorrect

50. In the vertex cover problem, the optimization problem is to find the vertex cover with _____ and the approximation problem is to find the vertex cover with _____.

(A) few vertices, few vertices
(B) fewest vertices, fewest vertices
(C) fewest vertices, few vertices
(D) few vertices, fewest vertices

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51. Which of the following does ***not*** belong to input alphabet S = {a, b}* for any language ?

(A) a (B) b (C) e (D) a^2

52. A language is regular if and only if it is accepted by

(A) DFA (B) NDFA (C) PDA (D) LBA

53. A DPDA is a PDA in which :

(A) No state has two outgoing transitions

(B) More than one state can have two or more outgoing transitions

(C) At least one state has more than one transition

(D) No state has two incoming transitions

54. The state of a Turing machine when the given input x is not defined on the current state and current input symbol is :

(A) Moving (B) Halting

(C) Looping (D) Halting and Moving

55. Consider the Lists A and B of three strings on {0, 1}. If :

X :	List A	1	10111	10	
	List B	111	10	0	and
Y :	List A	10	011	101	
	List B	101	11	011	then

which of the following is true ?

(A) Only PCP in X has solution

(B) Only PCP in Y has solution

(C) PCP in both X and Y has solution

(D) PCP neither in X nor in Y has solution

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56. Which of the following derivations is used by top-down parser ?

(A) Leftmost derivation

(B) Leftmost derivation in reverse

(C) Rightmost derivation

(D) Rightmost derivation in reverse

57. Choose the correct statement suiting syntax directed definitions from the following :

(A) Syntax directed definitions + Semantic rules = CFG

(B) Syntax directed definitions + CFG = Semantic rules

(C) CFG + Semantic rules = Syntax directed definitions

(D) CFG + flow graph = syntax directed definitions

58. The idea of cache memory is based on the _____.

(A) Properties of optimizing speed

(B) Heuristic 90-10 rule

(C) Fact that references cluster

(D) Property of locality of reference

59. Which of the following helps Assembler to deal with branching code ?

(A) One Pass Assembler

(B) Two Pass Assembler

(C) Debugger

(D) Interpreter

60. Which of the following optimization technique reduces the multiple jumps ?

(A) Latter optimization

(B) Peephole optimization

(C) Local optimization

(D) Loop optimization

Space for Rough Work

61. Consider a CSMA/CD network that transmits data at the rate of 100 mbps (10^8 bits per second) over 1 km cable without repeaters. Let the minimum frame size required for this network be 1250 bytes. Compute the signal speed of the cable, in terms of km/sec.

(A) 10000 (B) 20000

(C) 15000 (D) 24000

62. In Ethernet that uses Manchester encoding, the bit rate is _____.

(A) thrice the baud rate

(B) twice the baud rate

(C) half the baud rate

(D) same as the baud rate

63. Which layer of OSI reference model is responsible for decomposition of messages and generation of sequence numbers, in order to ensure correct re-composition, from end-to-end of a network ?

(A) Physical

(B) Data-link

(C) Transport

(D) Application

64. The divisor in a cyclic code is called _____.

(A) Degree

(B) Redundancy

(C) Connector

(D) Generator

Space for Rough Work

65. In computer networks, the transmission media are generally categorized as :

(A) Fixed or dynamic

(B) Deterministic or non-deterministic

(C) Guided or unguided

(D) Trained or untrained

66. The port number of POP is :

(A) 110

(B) 220

(C) 360

(D) 490

67. A piece of icon or image on a webpage, associated with another webpage is called _____.

(A) URL

(B) Plug-in

(C) Hyper icon

(D) Hyperlink

68. Which of the following reduces the likelihood of data leakage ?

(A) Cryptography

(B) Steganography

(C) Chronography

(D) Authentication

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69. Which type of multiplexing enables optimized utilization of the available bandwidth ?

(A) FDMA

(B) MDMA

(C) TDMA

(D) CDMA

70. The acronym DVMRP stands for :

(A) Distance Vector Multitask Routing Protocol

(B) Distance Vector Multicast Routing Protocol

(C) Distance Vector Mixed Routing Protocol

(D) Distance Vector Message Routing Protocol

71. Artificial Intelligence is a _____ approach which can make decisions based on logical reasoning and problem solving strategies.

(A) Heuristic search approach

(B) Greedy search approach

(C) State space approach

(D) Rational agent approach

72. Identify the atomic proposition in the following statements :

(A) Close the door

(B) $Y > 20$

(C) What a Large Camel !

(D) It is raining outside

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73. _____ search is performed by exploring all nodes at a given depth before proceeding to the next level.

(A) Depth first search

(B) Depth first deepening search

(C) Breadth first search

(D) Best first search

74. Which type of knowledge representation does ***not*** exhibit any learning capabilities ?

(A) Semantic Network

(B) Logical Representation

(C) Production Rules

(D) Frame Representation

75. Which type of planning in Artificial Intelligence is used to make decisions in a dynamic and uncertain environment ?

(A) Hierarchical Planning

(B) Goal Stack Planning

(C) Non-linear Planning

(D) Linear Planning

76. What is the role of pragmatics in Natural Language Processing ?

(A) To analyze semantics of sentences

(B) To find contextual meaning and implied communication

(C) To identify syntax errors in the text

(D) To find morphological analysis of words

Space for Rough Work

77. Which algorithm considers all moves from current state and selects the best move as the next state ?

(A) Steepest ascent hill climbing

(B) Branch and bound

(C) Means end analysis

(D) Constraint satisfaction

78. Backpropagation Neural Network is a technique used for :

(A) Transmission of error back through the network to adjust the inputs

(B) Updating weights based on error propagation

(C) Updating the number of hidden layers

(D) Adjusting hyper parameter values

79. Which of the following introduces non-linearity into neural network ?

(A) Binary step function

(B) ReLU function

(C) Convolution function

(D) Identity function

80. Which one of the following is ***not*** a type of mutation operator used in genetic algorithms ?

(A) Bit-flip mutation

(B) Swap mutation

(C) Inversion mutation

(D) Gaussian mutation

Space for Rough Work

81. The most appropriate logical expression for the sentence "You cannot use the waterslide if you are under 48 inches in height unless you are older than 14 years old" is;

(A) $(r \wedge s) \rightarrow \neg q$

(B) $(r \wedge \neg s) \rightarrow \neg q$

(C) $(r \wedge \neg s) \rightarrow q$

(D) $(r \vee \neg s) \rightarrow \neg q$

82. Find out which rule of inference is used in the argument "The meeting has been rescheduled and the conference room is empty now. Therefore, the meeting has been rescheduled now".

(A) Simplification rule

(B) Hypothetical syllogism

(C) Addition rule

(D) Conjunction rule

83. A relation R on a set S is called _____ if it is reflexive, antisymmetric and transitive.

(A) Partial ordering

(B) Equivalence relations

(C) Equivalence classes

(D) Transitive closure

84. Consider the following relations on {1, 2, 3, 4} :

R1 = { (1, 1), (1, 2), (2, 1), (2, 2), (3, 4), (4, 1), (4, 4) },

R2 = { (1, 1), (1, 2), (2, 1) },

R3 = { (1, 1), (1, 2), (1, 4), (2, 1), (2, 2), (3, 3), (4, 1), (4, 4)},

R4 = { (2, 1), (3, 1), (3, 2), (4, 1), (4, 2), (4, 3) },

R5 = { (1, 1), (1, 2), (1, 3), (1, 4), (2, 2), (2, 3), (2, 4), (3, 3), (3, 4), (4, 4) },

R6 = { (3, 4) }

Which of the relations are transitive ?

(A) R1, R2, R5, R6

(B) R4, R5, R6

(C) R1, R2, R3, R4, R5, R6

(D) R3, R4, R5

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85. In how many ways can 10 examination answer papers be arranged so that the best and worst papers never come together ?

(A) $8 \times 9!$ (B) $8 \times 8!$ (C) $7 \times 9!$ (D) $9 \times 8!$

86. _____ is not necessarily a property of a group.

(A) Existence of inverse for every element

(B) Associativity

(C) Commutativity

(D) Existence of identity

87. Consider the set $S = \{1, \omega, \omega^2\}$ where ω and ω^2 are cube roots of unity. If * denotes the multiplication operation, then the structure of (S, *) forms

(A) A group (B) An integral domain

(C) A ring (D) A field

88. Which of the following Euler circuit is impossible if number of vertices is greater than 2 ?

(A) C_n (B) Q_n (C) K_n (D) W_n

89. Consider a complete graph G with 5 vertices. The graph G has _____ spanning trees.

(A) 25 (B) 625

(C) 125 (D) 525

90. The amount of time by which an activity can be delayed without affecting project completion time is :

(A) Free float

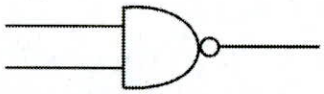
(B) Total float

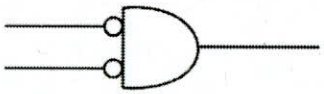
(C) Independent float

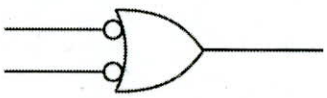
(D) Activity float

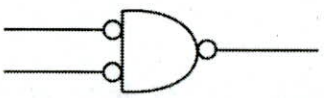
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91. Select the equivalent of NOR gate from the following :

(A) 

(B) 

(C) 

(D) 

92. The hexadecimal number $(1E.53)_{16}$ is equivalent to :

(A) $(35.684)_8$ (B) $(36.248)_8$ (C) $(34.340)_8$ (D) $(35.599)_8$

93. The register used as a working area in CPU is

(A) Program counter (B) Instruction register

(C) Pipeline register (D) Accumulator

94. Which of the following architecture is used in Modern computers ?

(A) Microarchitecture (B) Harvard architecture

(C) Von-Neumann architecture (D) Macro architecture

95. The primary objective of assembly language is :

(A) To make programming more difficult.

(B) To simplify programming by providing high level language constructs.

(C) To provide a way to interact with hardware at a low level.

(D) To provide a way to interact with hardware at a high level.

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96. In Microprogrammed Control, the data register is sometimes called

(A) Accumulator

(B) Branch register

(C) Sequence register

(D) Pipeline register

97. Specify the control word to perform addition between R2 and R3 and the result will be stored is R1.

(A) 010 011 001 00010

(B) 001 010 011 00100

(C) 011 010 001 00101

(D) 010 011 001 01010

98. In which addressing mode, the effective address is equal to the address part of the instruction ?

(A) Indexed

(B) Relative

(C) Register

(D) Direct

99. In asynchronous serial data transfer, we use _____ number of flag bits.

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

100. Hit ratio of cache memory is defined as

(A) Number of hits divided by total number of hits and misses.

(B) Number of hits divided by number of misses.

(C) Number of hits plus misses divided by number of hits.

(D) Number of misses divided by number of hits.

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Serial No.

Version Code

B1

COMPETITIVE EXAMINATION-2023

PAPER – II

SUBJECT: COMPUTER SCIENCE AND APPLICATION **SUBJECT CODE:24**

PAPER CODE	DURATION	TOTAL NO. OF QUESTIONS	MAXIMUM MARKS	MENTION YOUR REGISTER NUMBER
COP202324	TWO HOURS	100	200	

INSTRUCTIONS FOR CANDIDATES

DOs:

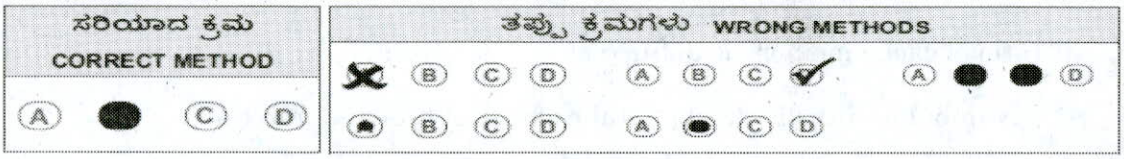
1. This question booklet is issued to you by the room invigilator **after the 2nd bell.**
2. Check whether the Register Number has been entered and shaded in the respective circles on the OMR answer sheet.
3. The version code of this question booklet should be entered on the OMR answer sheet and the respective circles should also be shaded completely.
4. The Version Code and Serial Number of this question booklet should also be entered on the Nominal Roll without any mistakes.
5. Compulsorily sign at the bottom portion of the OMR answer sheet in the space provided.

DONTs:

1. **THE TIMING AND MARKS PRINTED ON THE OMR ANSWER SHEET SHOULD NOT BE DAMAGED / MUTILATED / SPOILED.**
2. **Till** the **3rd Bell rings;**
   - Do not remove the seal present on the right hand side of this question booklet.
   - Do not; look inside this question booklet or start answering on the OMR answer sheet.

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1. In case of usage of signs and symbols in the questions, the regular textbook connotation should be considered unless stated otherwise.
2. This question booklet contains **100** questions and each question will have one statement and four different options / responses & out of which you have to choose one correct answer.
3. After the **3rd Bell rings,** remove the paper seal of this question booklet and check that this booklet does not have any unprinted or torn or missing pages or items etc., if so, get it replaced by a complete test booklet. Read each item and start answering on the OMR answer sheet.
4. Completely **darken / shade** the relevant circle with a **blue or black ink ballpoint pen against the question number on the OMR answer sheet.**



5. Please note that even a minute unintended ink dot on the OMR answer sheet will also be recognized and recorded by the scanner. Therefore, avoid multiple markings of any kind on the OMR answer sheet.
6. Use the space provided on each page of the question booklet for Rough Work. Do not use the OMR answer sheet for the same.
7. **Once the last Bell rings,** stop writing on the OMR answer sheet and hand over the **OMR answer sheet** to the room invigilator as it is.
8. After separating the top sheet (Office copy), the invigilator will return the bottom sheet replica (Candidate's copy) to you.
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