

COMMON P. G. ENTRANCE TEST – 2023 (CPET-2023)

Test Booklet No. :

1566

Subject Code : 07

Hall Ticket No. :

Subject : COMPUTER SCIENCE

TEST BOOKLET

Time Allowed : 60 Minutes

Full Marks : 80

: INSTRUCTIONS TO CANDIDATES :

1. The Test Booklet contains 16 pages including the cover page and 80 (Question No. 1 to 80) multiple choice questions.
2. DO NOT break the seal of the Test Booklet until the invigilator instructs to do so.
3. The candidates must check discrepancy, if any (like up-printed or torn or missing pages or missing questions) in the Test Booklet immediately after breaking the seal of the Test Booklet. If detected, the invigilator may be requested to replace the same.
4. Candidates are required to fill up and darken the **Hall Ticket No, Test Booklet Serial No. and OMR Answer Sheet Serial No.** in attendance sheet carefully. Wrongly filled in OMR Answer Sheet is liable for rejection.
5. Each question has four choices / answers marked (A), (B), (C), (D). Candidate has to select the most appropriate choice / answer to each question and darken the oval completely against the question number provided in the OMR Answer Sheet.
6. Indicate only one choice / answer from the options provided by darkening the appropriate oval in the OMR Answer Sheet. More than one response to a question shall be treated as a wrong answer.
7. Use only **Black Ball Point Pen** for darkening the oval for answering.
8. All the questions are compulsory and they carry equal marks. The total marks scored by a candidate depends on the number of correct choices / answers darkened in the OMR Answer Sheet. There will be no negative marking for wrong answers.
9. No candidate shall be allowed to leave the Examination Hall / Room till all OMR Answer Sheets have been collected by the invigilator.
10. On completion of the entrance test, the original OMR Answer Sheet be handed over to the invigilator. Candidates are allowed to take the second copy of the OMR Answer Sheet along with the used Test Booklet for reference.
11. Candidates are not allowed to carry any personal belongings including electronic devices such as scientific calculator, cell phones, headphones, ear buds, or any other type of devices that allow communication of any kind inside the Examination Room / Hall.
12. The candidates are advised not to scribble or make any mark on the OMR Answer Sheet except marking the answers at the appropriate places and filling up the details required. Rough work, if any, may be done in the blank sheet(s) provided at the end of the Test Booklet.
13. Any malpractice / use of unfair means will lead to your disqualification from the entrance test / admission process and may also lead to appropriate legal action as deemed fit.

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO

SEAL

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1. What will be the output of the following C code ?

```
#include <stdio.h>

struct point
{
    int x, y;
};

int main()
{
    struct point p1 = {5, 7};
    struct point *ptr = &p1;
    ptr->x = 5+2;
    printf("%d, %d", ptr->x-2, ptr->y);
    return 0;
}
```

(A) 5, 7

(B) 7, 7

(C) 9, 7

(D) Error in the code

2. What will be displayed when the following C program is executed ?

```
#include <stdio.h>

void display() {
    printf("%d %d", (010), (10));
}

int main()
{
    display();
    return 0;
}
```

(A) 10 10

(B) 010 10

(C) 8 10

(D) (010) (10)

3. Which of the following is not a valid file opening mode in C language ?
- (A) r+ (B) w+
(C) ab (D) rw
4. Which logic gate is represented by the algebraic function $x = A'B' + AB$?
- (A) NOR (B) XOR
(C) Exclusive-NOR (D) NAND
5. What is the minimum number of gates required to implement the Boolean function $(AB + C)$, if we have to use only 2-input NOR gates ?
- (A) 2 (B) 3
(C) 4 (D) 8
6. The switching expression corresponding to $f(A, B, C, D) = \sum (1, 4, 5, 9, 11, 12)$ is :
- (A) $A'BD + ACD' + BCD'$ (B) $ACD' + A'BC' + AC'D'$
(C) $ABC' + ACD + B'C'D$ (D) $BC'D' + A'C'D + AB'D$
7. Which of the following is the correct syntax for declaring an array of pointers of integers that has a size of 10 in C++ ?
- (A) `int *arr = new int*[10];` (B) `int arr = new int[10];`
(C) `int *arr = new int[10];` (D) `int **arr = new int*[10];`
8. Which of the following can be used in C++ to implement late binding ?
- (A) Operator overloading (B) Virtual Functions
(C) Friend function (D) Function overloading

9. What will be the OUTPUT of the following C++ program ?

```
#include<iostream>
using namespace std;
int main()
{
    int x=5;
    int y=5;
    auto check = [&x]()
    {
        x=10;
        y=20;
    }
    check();
    cout<<"Value of x: "<<x<<endl;
    cout<<"Value of y: "<<y<<endl;
    return 0;
}
```

- (A) There will be an error in the program
(B) Values of x and y will be printed as 10 and 20
(C) Values of x and y will be printed as 5 and 20
(D) Values of x and y will be printed as 5 and 5
10. The Inorder traversal of a Binary Search tree created by presenting data items in the order 50, 20, 80, 10, 40, 60, 30, 70, 90 will yield the sequence :
- (A) 50, 20, 80, 10, 40, 60, 30, 70, 90
(B) 90, 80, 70, 60, 50, 40, 30, 20, 10
(C) 90, 70, 30, 60, 40, 10, 80, 20, 50
(D) 10, 20, 30, 40, 50, 60, 70, 80, 90
11. When the infix expression $A/B+C+D \cdot E$ is converted to prefix, it gives :
- (A) $/AB++C \cdot DE$
(B) $++/ABC \cdot DE$
(C) $/++ABC \cdot DE$
(D) $+AB/C+AB/C \cdot DE$

12. How many swaps are required to sort the given array with values {20, 50, 10, 30, 40} using bubble sort ?
- (A) 3 (B) 4
(C) 5 (D) 6
13. Which one of the following is the overflow condition if a circular queue is implemented using array having size MAX ?
- (A) rear=MAX (B) rear=MAX-1
(C) rear=MAX+1 (D) front=(rear+1) mod max
14. If a binary tree is represented as an array, the right child of the node with index i will be at position _____.
- (A) $2i$ (B) $2i - 1$
(C) $2i + 1$ (D) $2i + 2$
15. In an M-way search tree, all nodes except the root must have at least _____ keys and a maximum of _____ keys.
- (A) $\lceil m/2 \rceil$ & $m+1$ (B) $\lceil m/2 \rceil - 1$ & $m-1$
(C) $\lceil m/2 \rceil + 1$ & m (D) $\lceil m/2 \rceil + 1$ & $m+1$
16. What is the time complexity of Heap sort in the average case ?
- (A) $O(\log n)$ (B) $O(n^2)$
(C) $O(n \log n)$ (D) $O(\log n + 1)$
17. Which of the following is not a role of Operating System ?
- (A) Code optimizer (B) Resource allocator
(C) Control program (D) Service Provider
18. The next CPU burst time of three processes A, B, and C are 24, 3, 3 respectively. What will be the average waiting time using the first-come-first-serve scheduling ?
- (A) 10 (B) 17
(C) 15 (D) 30

19. Consider a disk r/w request queue as 98, 183, 37, 122, 14, 124, 65, 67 with the r/w head at track 53. What will be the total head movement using Shortest-Seek-Time-First disk scheduling technique ?
- (A) 130 (B) 230
(C) 236 (D) 336
20. Which of the following page replacement method may lead to Belady's anomaly ?
- (A) FIFO (B) Optimal
(C) LRU (D) LFU
21. Thrashing leads to _____.
- (A) High CPU utilization (B) CPU crash
(C) Low CPU utilization (D) Deadlock
22. Banker's algorithm is useful for _____.
- (A) Deadlock prevention (B) Deadlock avoidance
(C) Deadlock detection (D) Deadlock recovery
23. Which of the following can lead to Rendezvous ?
- (A) Bounded buffer (B) Unbounded buffer
(C) Zero capacity buffer (D) Infinite capacity buffer
24. The synchronization tool which does not require busy waiting is known as _____.
- (A) Critical section (B) Semaphore
(C) Mutual exclusion (D) Mutex
25. Which of the following is not a database language ?
- (A) DDL (B) DML
(C) SQL (D) DSL
26. An entity which does not have a key attribute to uniquely identify each instance of that entity is known as _____.
- (A) Derived entity (B) Weak entity
(C) Tangible entity (D) Conceptual entity

27. In a functional dependency $PQ \rightarrow R$, if either P or Q alone can uniquely identify R, then it is referred to as _____.
- (A) Transitive dependency (B) Full functional dependency
(C) Partial dependency (D) Multi-valued dependency
28. The 5th Normal form is otherwise known as _____.
- (A) BCNF (B) PJNF
(C) CJNF (D) TJNF
29. Which of the following is not a valid state in a database transaction ?
- (A) Commit (B) Partially commit
(C) Abort (D) Restart
30. Which of the following statement is not true in the context of concurrency control in database transactions ?
- (A) A transaction having an Exclusive lock can both read and modify a data item.
(B) Time stamp protocol decides the order in which conflicting transactions are to be executed.
(C) Lock based protocol is deadlock free.
(D) In the growing phase, a new lock can be obtained on a data item but none of the locks can be released
31. How many relations exist from set X to set Y if the set X and set Y has 5 and 7 elements respectively ?
- (A) 2^{12} (B) 2^{24}
(C) 35 (D) 2^{35}
32. Which of the following statement is incorrect if X and Y are the two non-empty relations on the set S ?
- (A) If X and Y are reflexive, then the intersection of X and Y is also reflexive.
(B) If X and Y are transitive, then the union of X and Y is not transitive.
(C) If X and Y are transitive, then the intersection of X and Y is also transitive.
(D) If X and Y are symmetric, then the union of X and Y is not symmetric.

33. The number of reflexive closure of the relation $\{(0,1), (1,1), (1,3), (2,1), (2,2), (3,0)\}$ on the set $\{0, 1, 2, 3\}$ is _____.
- (A) 6 (B) 12
(C) 24 (D) 36
34. What is the Cartesian product of set A and set B, if the set $A = \{1, 2\}$ and set $B = \{a, b\}$?
- (A) $\{(1, a), (1, b), (2, a), (b, b)\}$ (B) $\{(1, a), (2, a), (1, b), (2, b)\}$
(C) $\{(1, 1), (a, a), (2, a), (1, b)\}$ (D) $\{(1, 1), (2, 2), (a, a), (b, b)\}$
35. Which one of the following is a valid declaration within an interface definition ?
- (A) `public final double methoda();`
(B) `static void methoda(double d1);`
(C) `public double methoda();`
(D) `protected void methoda(double d1);`
36. Which keyword is used by a method to refer to the object that invoked it ?
- (A) `import` (B) `catch`
(C) `this` (D) `extend`
37. Which of these methods of a Thread class is used to suspend a thread for a period of time ?
- (A) `terminate()` (B) `sleep()`
(C) `pause()` (D) `suspend()`
38. What do you mean by nameless objects ?
- (A) An object that has no reference
(B) An object created by using the `new` keyword
(C) An object of a superclass created in the subclass
(D) An object without having any name but having a reference

39. What is the output of the following code snippet ?

```
public class Test2 {  
    public static void main(String[] args) {  
        StringBuffer s1 = new StringBuffer("Complete");  
        s1.setCharAt(1, 'i');  
        s1.setCharAt(7, 'd');  
        System.out.println(s1);  
    }  
}
```

- (A) iomplede (B) iompletd
(C) Cimplete (D) Cimpletd

40. What is the use of the intern() method ?

- (A) It creates a new string in the database
(B) It returns the existing string from memory
(C) It modifies the existing string in the database
(D) It allocates internal memory for a variable

41. If there are N routers from source to destination, a total end to end delay in sending packet P will be (L is the number of bits in the packet and R is the transmission rate)

- (A) L/R (B) $(N*L)/R$
(C) $(2N*L)/R$ (D) N

42. When a DNS server accepts and uses incorrect information from a host that has no authority giving that information, then it is called _____.

- (A) DNS lookup (B) DNS hijacking
(C) DNS spoofing (D) DNS configuring

43. What is the maximum number of IP addresses that can be assigned to hosts on a local subnet that uses the 255.255.255.224 subnet mask ?

- (A) 24 (B) 30
(C) 32 (D) 64

44. The maximum length (in bytes) of an IPv4 datagram is ?
 (A) 32 (B) 512
 (C) 1024 (D) 65535
45. On a simplex data link, which of the following is a possible error recovery technique ?
 (A) Automatic Repeat Request (ARQ) (B) Use of hamming codes
 (C) Backward Error Correction (BEC) (D) Downward Error Correction (DEC)
46. Which of the following is the most commonly used boundary representation for a 3-dimensional graphics object?
 (A) System polygon (B) Data polygon
 (C) Surface polygon (D) Volume polygon
47. 'Skala' is an example of which of the following type of clipping ?
 (A) Curve clipping (B) Line clipping
 (C) Polygon clipping (D) Point clipping
48. Which of the following equation is used in 2D translation to move a point(x, y) to the new point (x', y')?
 (A) $x' = x + t_x$ and $y' = y - t_y$ (B) $x' = x + t_x$ and $y' = y + t_y$
 (C) $x' = x - t_x$ and $y' = y - t_y$ (D) $x' = x + t_y$ and $y' = y + t_x$
49. The process of displaying 3D into a 2D display unit is called as :
 (A) Projection (B) Resolution
 (C) Transformation (D) Rasterization
50. Which of the following is not the element associated with the HTML table layout ?
 (A) Spanning (B) Color
 (C) Alignment (D) Size
51. Which HTML tag is used to insert an image ?
 (A) `<img alt="htmllogo.jpg" />` (B) `<img url="htmllogo.jpg" />`
 (C) `<img link="htmllogo.jpg" />` (D) ``
52. Which software development life cycle model is appropriate if the development team has less experience on similar projects ?
 (A) Waterfall (B) RAS
 (C) Prototype (D) Spiral

53. Which of the following is used to predict the effort as a function of LOC or FP ?
- (A) FP-based estimation
 - (B) COCOMO
 - (C) Both COCOMO and FP-based estimation
 - (D) Process-based estimation
54. Which of the following is not a correct software testing technique ?
- (A) Collaboration testing
 - (B) Unit testing
 - (C) Integration testing
 - (D) System testing
55. Grouping of all functionally related elements is known as _____.
- (A) Coupling
 - (B) Cohesion
 - (C) Clustering
 - (D) Modularization
56. Which of the following is a heuristic search technique ?
- (A) Breadth first
 - (B) Depth first
 - (C) A*
 - (D) Alpha-Beta pruning
57. Which of the knowledge representation technique has a strong theoretical foundation ?
- (A) Semantic net
 - (B) Frames
 - (C) Scripts
 - (D) Predicate logic
58. What does the Bayesian network provide ?
- (A) Complete description of the problem
 - (B) Complete description of the domain
 - (C) Partial description of the problem
 - (D) Partial description of the domain
59. What is the time complexity of Dijkstra's algorithm ?
- (A) $O(N)$
 - (B) $O(N^2)$
 - (C) $O(N^3)$
 - (D) $O(\log N)$

60. Kruskal's algorithm is a _____.
- (A) dynamic programming algorithm
 - (B) divide and conquer algorithm
 - (C) greedy algorithm
 - (D) approximation algorithm
61. Which of the following is a type of impact printer ?
- (A) Laser printer
 - (B) Dot matrix printer
 - (C) Ink jet printer
 - (D) Thermal printer
62. Which of the following is not a standard service model in cloud computing ?
- (A) SAAS
 - (B) IAAS
 - (C) MAAS
 - (D) PAAS
63. Which of the following is not a data mining technique ?
- (A) Clustering
 - (B) Classification
 - (C) Data cleaning
 - (D) Data warehousing
64. If M denotes the number of memory locations and N denotes the word size, then an expression that denotes the storage capacity is _____.
- (A) $M + N$
 - (B) $M * N$
 - (C) $2(M * N)$
 - (D) $2(M + N)$
65. Which of the following is used to transfer data between the processor (CPU) and memory ?
- (A) TLB
 - (B) Cache
 - (C) Register
 - (D) Buffer
66. What is the full form of DRAM ?
- (A) Dependent Remote Access Memory
 - (B) Dynamic Random-Access Memory
 - (C) Dynamic Remote Access Memory
 - (D) Dependent Random-Access Memory

67. Why is a macro used in place of a function ?
- (A) It reduces code size
 - (B) It reduces execution time
 - (C) It enhances the accuracy
 - (D) The need for memory to store data is reduced

68. What will be the output of the following C code ?

```
#include <stdio.h>
```

```
int main()
```

```
{
```

```
    int *ptr, a = 10;
```

```
    ptr = &a;
```

```
    *ptr += 1;
```

```
    printf("%d,%d/n", *ptr, a);
```

```
}
```

- (A) 10, 10
- (B) 11, 10
- (C) 11, 11
- (D) 10, 11

69. Which of the following is a valid expression in C language ?

- (A) int my_no = 50,000;
- (B) int my_no = 50000;
- (C) int my no = 5000.0;
- (D) int my no = 500.00;

70. Which data structure can be used to evaluate a recursive function ?

- (A) Queue
- (B) Circular queue
- (C) Stack
- (D) Deque

71. Which of the following sorting technique uses the divide-and-conquer philosophy ?

- (A) Insertion sort
- (B) Bubble sort
- (C) Quick sort
- (D) Selection sort

72. Which of the following is not a keyword in Python language ?

- (A) raise
- (B) try
- (C) val
- (D) with

73. Which of the following operators is the correct option for a^n ?
(A) $a \wedge \wedge n$ (B) $a^{**}n$
(C) $\text{pow}(a*n)$ (D) $a \wedge n$
74. Is Python code compiled or interpreted ?
(A) Python code is both compiled and interpreted
(B) Python code is neither compiled nor interpreted
(C) Python code is only compiled
(D) Python code is only interpreted
75. Which keyword is used for function in Python language ?
(A) function (B) func
(C) def (D) define
76. Which Python command is used to add a new element to a list ?
(A) `list1.addLast(5)`
(B) `list1.addEnd(5)`
(C) `list1.append(5)`
(D) `list1.add(5)`
77. Which of the following is not a variable scope in PHP ?
(A) Static (B) Extern
(C) Local (D) Global
78. Which of the following tag is used to mark the beginning of a paragraph ?
(A) `<TD>` (B) `<br>`
(C) `<p>` (D) `<pr>`
79. Which of the following is used to display an output in PHP ?
(A) Write (B) Echo
(C) Print (D) Both (B) and (C)
80. Which one of the following is not used to generate dynamic web pages ?
(A) CSS (B) PHP
(C) JSP (D) ASP.NET



SPACE FOR ROUGH WORK

SEAL

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