

**COMMON P. G. ENTRANCE TEST – 2024 (CPET-2024)**

Test Booklet No. : **02748**

Subject Code : **22**

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 Nos. 1 to 80) multiple choice questions.
2. DO NOT break open 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, earbuds, 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**



1. What does the following C code display ?

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

```
int main()
```

```
{
```

```
    int p1 = 1, p2 = 2, p3, i = 3 ;
```

```
    printf("%d\t%d", p1, p2) ;
```

```
    while(i <= 5)
```

```
    {
```

```
        p3 = p1 + p2 ;
```

```
        printf("\t%d", p3) ;
```

```
        p1 = p2 ; p2 = p3 ; i = i + 1 ;
```

```
    }
```

```
    return 0 ;
```

```
}
```

(A) 0 1 1 2 3

(B) 1 2 3 5 8

(C) 1 2 3 4 5

(D) 1 3 5 7 9

2. What will be the output of the following C program ?

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

```
main()
```

```
{
```

```
    int n = 579, d, s = 0 ;
```

```
    while (n > 0) {
```

```
        d = n % 10 ; s += d ; n = n/10 ;
```

```
    }
```

```
    printf("%d", s) ;
```

```
}
```

(A) 57

(B) 9

(C) 21

(D) 5

3. What will be the output of the following C code ?
- ```
#include<stdio.h>
#include<math.h>
main()
{float m = 4.3 ;
printf("%d", int(pow(int(cell(m)), int(floor(m)))));
}
```
- (A) 125 (B) 1024  
(C) 64 (D) 625
4. The equivalent pointer notation for the subscripted variable  $p[0][2]$  is :
- (A)  $*((p + 0) + 2)$  (B)  $*(* (p + 2))$   
(C)  $*(* (p + 0) + 2)$  (D)  $** (p + 2)$
5. The following code segment is the logic for :
- ```
for(i = 1 ; i <= n - 1 ; i++)
{ for(j = i + 1 ; j <= n ; j++)
{ if(a [i] > a[j])
{ temp = a[i] ; a[i] = a[j] ; a[j] = temp ; }
}
}
```
- (A) Insertion sort (B) Selection sort  
(C) Bubble sort (D) Exchange sort
6. In 2's complement representation, the binary number 11100101 is equivalent to the decimal number :
- (A) + 27 (B) - 27  
(C) + 25 (D) - 25
7. The key difference between synchronous DRAM and asynchronous DRAM is based on their operation relative to :
- (A) Clock speed of a processor (B) Memory size  
(C) System clock (D) Volatility of data
8. A field-programmable gate array is a type of :
- (A) Programming language (B) Array processor  
(C) ROM (D) Configurable integrated circuit

9. In a JK flip-flop, a toggle condition occurs when :  
 (A) J = 1, K = 1 (B) J = 1, K = 0  
 (C) J = 0, K = 1 (D) J = 0, K = 0
10. What happens if the input is high in a finite state machine ?  
 (A) No change of state (B) Transition to the previous state  
 (C) Change of state (D) Invalid state
11. Which of the following statement is false ?  
 (A) A constructor is used to initialize an object at the time of its creation  
 (B) One can have multiple constructors in a C++ program  
 (C) A constructor can be overloaded  
 (D) The return type of constructor is void
12. The pointer which is set to contain the address of the object at the time of object creation is referred as \_\_\_\_\_ pointer.  
 (A) New (B) This  
 (C) Current (D) Active
13. What will be the output of the following C++ code ?
- ```
#include <iostream>
#include <string>
using namespace std;
class count
{private:
    int n;
public:
    count() {n = 0;}
    count operator ++(int)
    {
        n--; return *this;
    }
    void display() {cout << "n=" << n << endl;}
```
- ```
};
int main()
{count obj; obj++; obj.display(); return 0;
}
```
- (A) n = -1 (B) n = 0  
 (C) n = 1 (D) n = 2

14. eof() is a member function of \_\_\_\_\_ class.

- (A) fstream
- (B) ofstream
- (C) ifstream
- (D) Ios

15. What will be the value of y and z when the following C++ code is executed ?

```
#include <iostream>
#include <string>
using namespace std ;
class base
{private:
    int x;
protected:
    int y;
public:
    int z;
};
class dd: public base
{
    public:
        void setvalue() {y = 2; z = 3;}
        void display() {cout<<"y="<<y<<endl<<"z="<<z<<endl;}
};
int main()
{dd obj; obj. setvalue(); obj.display();}
```

- (A) y=2 ; z=2
- (B) y=3 ; z=3
- (C) y=2 ; z=3
- (D) y=3 ; z=2

16. Given a 1-D array containing integer values, if you want to increment each of the values of the array by 5 while reading the array from first to last, what will be the time complexity of the algorithm ?

- (A)  $O(\log n)$
- (B)  $O(n)$
- (C)  $O(2n)$
- (D)  $O(n/2)$

17. When the infix expression  $15*(4+8)-9/(6+2-5)+3*(7-3)$  is converted to postfix expression, what will be the equivalent expression ?
- (A)  $15\ 4\ * \ 8\ + \ 9\ 6\ 2\ + \ 5\ /\ - \ - \ 3\ 7\ 3\ - \ * \ +$   
 (B)  $15\ * \ 4\ 8\ + \ 9\ + \ 6\ - \ 2\ 5\ /\ - \ 3\ 7\ 3\ - \ * \ +$   
 (C)  $15\ 4\ 8\ + \ * \ 9\ 6\ 2\ + \ 5\ - \ /\ - \ 3\ 7\ - \ 3\ + \ *$   
 (D)  $15\ 4\ 8\ + \ * \ 9\ 6\ 2\ + \ 5\ - \ /\ - \ 3\ 7\ 3\ - \ * \ +$
18. A binary search tree is constructed by inserting items in the order 55, 25, 60, 30, 80, 40, 90 and 75. What sequence will be generated, if the tree is traversed in post-order ?
- (A) 25, 30, 40, 75, 90, 80, 60, 55      (B) 40, 30, 25, 75, 90, 80, 60, 55  
 (C) 90, 80, 75, 60, 55, 40, 30, 25      (D) 55, 25, 30, 40, 60, 80, 75, 90
19. What is the maximum number of key values that can be stored in a B-tree of order 4 with a height of 2 ?
- (A) 47      (B) 96  
 (C) 63      (D) 60
20. What is the overall time complexity of heap sort ?
- (A)  $O(\log n)$       (B)  $O(n \log n)$   
 (C)  $O(n + \log n)$       (D)  $O(n^2)$
21. How can the page fault frequency in virtual memory be reduced ?
- (A) By allocating less number of pages per process  
 (B) By reducing the page size  
 (C) By using a working set model  
 (D) By increasing the frame size
22. What will be the total number of page faults for the page reference string : 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6 using the LRU replacement technique with 5 frames per process ?
- (A) 8      (B) 7  
 (C) 6      (D) 5
23. Which of the following scheduler is called most frequently ?
- (A) Short-term scheduler      (B) Medium-term scheduler  
 (C) Job scheduler      (D) I/O scheduler

24. Consider three processes A, B, and C with their CPU burst times 10 ms, 5 ms, and 2 ms. What will be the average waiting time using Round-Robin scheduling with a time quantum of 2 ms ?
- (A) 5.66 (B) 6.33  
(C) 19 (D) 5.0
25. A situation where a set of processes is blocked, waiting for some resources held by other processes belonging to the same set is referred to as :
- (A) Mutual exclusion (B) Critical section  
(C) Deadlock (D) Thrashing
26. The number of tuples in a relational table indicates the :
- (A) Degree of the relation (B) Cardinality of the relation  
(C) Domain of the relation (D) Arity of the relation
27. A relation R is said to be in \_\_\_\_\_ if and only if every determinant is a candidate key.
- (A) 2 NF (B) 3 NF  
(C) BCNF (D) 4 NF
28. An association between two attributes of the same relational table is known as :
- (A) Functional dependency (B) Transitive dependency  
(C) Multi-valued dependency (D) Join dependency
29. While executing a database transaction, when the final statement has been executed, the transaction is said to be in a :
- (A) Committed state (B) Partially committed state  
(C) Check-pointing state (D) Final state
30. In the lock-based concurrency control protocol, the shrinking phase refers to the phase in which :
- (A) Locks are requested (B) Transactions wait for locks  
(C) All locks are released (D) Locks are granted
31. Let  $p$  : Mohan is rich,  $q$  : Mohan is happy, then the statement : Mohan is rich, but Mohan is not happy can be written as :
- (A)  $p \wedge q$  (B)  $p \vee q$   
(C)  $\sim p \wedge q$  (D)  $p \wedge \sim q$

32. How many DFAs exist with two states over input alphabet  $\{0, 1\}$  ?  
 (A) 16 (B) 32  
 (C) 64 (D) 128
33. Pumping lemma for regular language is generally used for proving :  
 (A) Equivalence of two regular expressions  
 (B) A given grammar is regular  
 (C) A given grammar is not regular  
 (D) A given grammar is ambiguous
34. In a get-together party, every person present shakes the hand of every other person. If there were 90 handshakes in all, how many persons were present at the party ?  
 (A) 14 (B) 15  
 (C) 16 (D) 17
35. Which of the following algorithm can be used to solve the Hamiltonian path problem efficiently ?  
 (A) Divide and conquer (B) Branch and bound  
 (C) Iterative improvement (D) Greedy algorithm
36. In Java programming, the keyword used to create a constant variable is :  
 (A) static (B) const  
 (C) final (D) extends
37. Which of the following is an incorrect array declaration in Java ?  
 (A) `int [] arr = new int[5];` (B) `int arr[] = int[5] new;`  
 (C) `int arr[] = new int[5];` (D) `int arr[]; arr = new int[5];`
38. What will be the output of the following Java code ?  

```
public class Test {
    public static void main (String[] args) {
        String str = "Good";
        str = "Morning";
        System.out.println(str);
    }
}
```

 (A) Good (B) Morning  
 (C) Good Morning (D) Error

39. Which method is automatically invoked during garbage collection in Java ?  
(A) terminate() (B) destroy()  
(C) finalize() (D) malloc()
40. In Java, which of the following is the correct way of implementing an interface 'Department' by a class 'Employee' ?  
(A) Class Employee implements Department{ }  
(B) Class Employee extends Department{ }  
(C) Class Department implements Employee{ }  
(D) Class Employee imports Department{ }
41. Which of the following device determines the optimal path for data to travel from the source to the destination network ?  
(A) Modem (B) Repeater  
(C) Switch (D) Router
42. A method of data transmission that breaks data into small packets and sends them independently is known as :  
(A) Circuit switching (B) Packet switching  
(C) Multiplexing (D) Packet forwarding
43. The purpose of "Stop and Wait ARQ" is to :  
(A) Increase the speed of data transmission  
(B) Use minimum network bandwidth  
(C) Ensure reliable delivery of data frames  
(D) Detect error in data being transmitted
44. In which of the following channelization protocol synchronization is required ?  
(A) FDMA (B) TDMA  
(C) CDMA (D) CSMA
45. IPv6 has an address space of :  
(A)  $2^{128}$  (B)  $2^{64}$   
(C)  $2^{32}$  (D)  $2^{256}$
46. The process of repositioning an object along a circular path is called :  
(A) Translation (B) Scaling  
(C) Rotation (D) Reflection

47. Which of the following algorithm is used to fill the interior of a polygon ?  
 (A) Flood fill algorithm (B) Boundary fill algorithm  
 (C) Scan line polygon fill algorithm (D) Shear transformation algorithm
48. The phase of determining the appropriate pixels for representing images or graphics object is called as :  
 (A) Transformation (B) Translation  
 (C) Scaling (D) Rasterization
49. Bresenham's algorithm is used to :  
 (A) Generate a line (B) Generate a square  
 (C) Generate an ellipse (D) Generate a rectangle
50. If a  $3 \times 3$  matrix shears in the X direction, how many elements of it are '1' ?  
 (A) 3 (B) 6  
 (C) 9 (D) 1
51. What is the use of HTML <iframe> element ?  
 (A) To display images (B) To embed external web content  
 (C) To embed audio files (D) To embed image files
52. What is the correct order of the CSS box model ?  
 (A) Padding, Border, Width, Height  
 (B) Padding, Margin, Content, Border  
 (C) Margin, Padding, Border, Content  
 (D) Border, Margin, Height, Width
53. What is the correct way to link an external CSS file to an HTML document ?  
 (A) <link rel="stylesheet" href="styles.css">  
 (B) <link>styles.css</link>  
 (C) <style>styles.css</style>  
 (D) <css src="styles.css"></css>
54. Which of the following is used for concatenation in PHP ?  
 (A) append() (B) + (plus)  
 (C) . (dot) (D) \* (Asterisk)

55. In Java Script, which of the following function of the String object returns the character in the string starting at the specified position to the specified number of characters ?
- (A) substring() (B) split()  
(C) slice() (D) substr()
56. Which of the following software development model is more flexible, and involves close collaboration between the development team and the customer to ensure that the product meets their expectations ?
- (A) Spiral model (B) RAD  
(C) Agile development model (D) Waterfall model
57. What is true about COCOMO ?
- (A) It estimates the duration of a software project  
(B) It is a software cost estimation model  
(C) It is helpful in finding software requirements  
(D) It is a software testing technique
58. The objective of SCM is to :
- (A) Develop a software quickly  
(B) Monitor and control changes in a software  
(C) Test a software properly  
(D) Estimate the cost of a software
59. The degree of interdependence between software modules is referred to as :
- (A) Modularity (B) Cohesion  
(C) Reusability (D) Coupling
60. The software testing method that evaluates the overall functionality and performance of a complete and fully integrated software solution is called :
- (A) Integration testing (B) System testing  
(C) Blackbox testing (D) Whitebox testing
61. Which of the following is not an attribute of an intelligent agent ?
- (A) Autonomous control (B) Ability to perceive its environment  
(C) Exhibit goal directed behavior (D) Exhibit irrational behavior

62. Which of the following is an informed search technique ?
- (A) Depth first search (B) Breadth first search  
(C) Best first search (D) Binary search
63. What is the objective of Alpha-beta pruning algorithm ?
- (A) To determine the next state  
(B) To eliminate some of the less promising alternative states  
(C) To eliminate the previous states  
(D) To apply back tracking
64. Which of the following knowledge representation scheme is suitable for stereotyped sequence of expected events ?
- (A) Frames (B) Production rules  
(C) Semantic nets (D) Scripts
65. Bayesian probabilistic reasoning is suitable for dealing with :
- (A) Inconsistencies (B) Uncertainties  
(C) Determinism (D) Adaptability
66. Which of the following cannot be adopted to solve recurrence relations ?
- (A) Substitution method (B) Recursion tree method  
(C) Elimination method (D) Master method
67. Which of the following method is not suitable for collision resolution ?
- (A) Linear probing (B) Non-linear probing  
(C) Quadratic probing (D) Double hashing
68. The fractional knapsack problem can be solved by :
- (A) Recursive approach (B) Iterative approach  
(C) Greedy approach (D) Dynamic programming
69. The main use of dynamic programming is to solve :
- (A) Searching problems (B) Optimization problems  
(C) Uncertainties (D) Recurrence relations

70. Which of the following is capable of handling graphs with negative edge weights ?  
(A) Prim's algorithm (B) Kruskal's algorithm  
(C) Bellman-Ford algorithm (D) Dijkstra algorithm
71. What is the full form of the abbreviation OLAP ?  
(A) On-line Analysis and Processing (B) On-line Analytical Product  
(C) On-line Analytical Processing (D) On-line Access Permission
72. What is the objective of FP-tree algorithm ?  
(A) To search an item in a tree data structure  
(B) To find frequent patterns in large databases  
(C) To find the shortest path between two nodes  
(D) To traverse a tree in a systematic manner
73. Which of the following is a non-impact printer ?  
(A) Dot matrix printer (B) Line printer  
(C) Laser printer (D) Daisy wheel printer
74. Which memory acts as a buffer between RAM and CPU in order to speed up the system performance ?  
(A) Buffer memory (B) Auxiliary memory  
(C) Cache memory (D) ROM
75. Which is not a valid storage class in C programming ?  
(A) extern (B) auto  
(C) register (D) dynamic
76. Which of the following is not a data type in Python programming ?  
(A) dict (B) class  
(C) list (D) tuple
77. What is the output of the following Python code ?  
b = "Examination"  
print(b[2:5])  
(A) xami (B) ami  
(C) amin (D) xamin

78. What is the full form of the abbreviation HTTP ?

- |                                     |                                    |
|-------------------------------------|------------------------------------|
| (A) Hypertext Transmission Protocol | (B) Hypertext Transaction Protocol |
| (C) Hypertext Transfer Protocol     | (D) Hypertext Test Protocol        |

79. What is PHP ?

- |                      |                                    |
|----------------------|------------------------------------|
| (A) Operating system | (B) Server side scripting language |
| (C) Browser program  | (D) Database query language        |

80. Which of the following is not a standard service model in cloud computing ?

- |          |          |
|----------|----------|
| (A) SaaS | (B) PaaS |
| (C) IaaS | (D) YaaS |



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