

INSTRUCTIONS TO CANDIDATES

Candidate should read the following instructions before attempting the question paper.


1. **DO NOT CLOSE THE BROWSER ANYTIME DURING THE EXAM.**
2. Candidate **should check his/her name and hall ticket number** being displayed on the screen. In case of any discrepancy, it should be reported to Invigilator immediately.
3. Candidate should ensure that he/she has marked attendance on the attendance sheet and also ensure that session id has also been recorded. Any other session id which has not been mentioned in the attendance sheet would not be considered and all responses on that session id would be treated as null and void.
4. Do not start the exam (do not click button) before instructed to do so by the Invigilator.
5. **Every Section has 50 objective-type questions.** Each objective-type question has four choices of which only one is correct. Candidate should select the radio button, given below the question, corresponding to his/her correct choice.
6. Marking scheme of C-CAT is as follows:
 - a. +3 (plus three) marks for each correct answer.
 - b. -1 (minus one) mark for each wrong answer.
 - c. 0 (zero) mark for each un-attempted question.
7. **Duration of each Section is ONE hour.** No candidate will be allowed to leave the examination hall before the completion of exam duration.
8. On clicking the button given at the bottom of the Instructions page, candidate will be directed to the question display screen.
9. Candidate should **note down the Session ID** that is displayed on the question screen after clicking on button.

10. Once the exam is started:-

- a. **Candidate should not close the browser. In case the browser is closed accidentally, it SHOULD BE reported to the Invigilator immediately.**
- b. **Candidate should not open any other software application on the computer system.**
- c. Candidate should neither shut down the machine nor fiddle with allocated hardware or software.
- d. In case of any problem it should be reported to Invigilator.

11. Candidate can navigate through questions using scroll bar or directly through the question number grid.

12. C-CAT screen contains the following buttons with the below specified functionality:

Button	Functionality
Examination Instruction	This link will open the instructions for the exam. After reading the instructions candidate has to click on  button to move back to the questions interface.
Mark for Review	In case a candidate is not sure about the answer, then he/she can use this Button to mark the question for a visit later. It will be shown with a ? against the question (in the question number grid) if the question has not been answered but has marked it for review. In case candidate has answered the question and marked it for review, then √? will be displayed against the question in the question number grid.
Clear Answer	This button will clear the option marked and the question will be shown as un-answered.

13. Each candidate will be provided one A4 size sheet for rough work. Candidates have to record their Name, hall ticket number and session ID on the rough sheet. They have to return the rough sheet to the Invigilator before leaving the exam hall.

14. Calculators, mobile phones, pagers and electronic gadgets in any form are not allowed to be used in the Exam Hall.

15. Candidate will be disqualified if found indulging in any kind of malpractice.

1. Which of the following code properly copies contents of str1 to str2?

- i)

```
void string_copy(char *str1,char *str2)
{
    while((*str1++=*str2++));
}
```
- ii)

```
void string_copy(char **str1,char **str2)
{
    *str1=*str2;
}
```

- A. both i and ii
- B. i only
- C. ii only
- D. Neither i nor ii

2. If the command is > copy file1 file2

What is the value of argc in the following code?

```
int main(int argc, char *argv[])
{
    printf("%d",argc);
}
```

- A. 2
- B. 4
- C. 3
- D. 0

3.

```
int main(int argc, char *argv[])
{
```

```
int * const piptr;  
int idata=10;  
piptr=&idata;  
printf("%d",*piptr);  
}
```

What is the output of the following program?

- A. 10
- B. Garbage
- C. Address of idata.
- D. Compilation Error

4. What is the Output of the following code?

```
#include<stdio.h>  
int main()  
{  
    static int array[6][2]=  
    {  
        {' ','s'},{'d','r'},{'a','w'},  
        {'k','c'},{'a','b'},{'c','d'}  
    };  
    int *p=(int *)(array+4);  
    for(++p;p>=(int *)array; putchar(*p--));  
    return 0;  
}
```

- A. ackward
- B. backwards

- C. ab aw dr
- D. Error

5. In a Queue, Insertion of an element takes place at the _____ and the deletion of an element takes place at the _____.

- A. front , rear
- B. rear , front
- C. front , front
- D. rear, rear

6. What is the output of the following piece of code?

```
#include <stdio.h>
main()
{
    int *p , num;
    p = &num;
    *p = 100;
    printf("%d" , num);
    (*p)++;
    printf("%d" , num);
    (*p)--;
    printf("%d" , num);
}
```

- A. 100 101 101
- B. 100 100 100
- C. 101 101 101

D. 100 101 100

7. In the declarations

```
const int *psptr;  
int * const psptr1;
```

psptr is a _____ and psptr1 is a _____.

- A. constant pointer to an int , pointer to a constant int
- B. pointer to a constant int , constant pointer to an int
- C. Pointer to an int, constant pointer to an int
- D. Pointer to an int, pointer to an int

8. What does the following code do, if ptr is a pointer to the first node of the linked list?

```
void f(Node** ptr)  
{  
    Node* t =*ptr;  
    *ptr=(*ptr)->next;  
    free(t);  
}
```

- A. It adds a node at the beginning of the linked list
- B. It removes the second node from the linked list
- C. It removes the first node from the linked list
- D. It removes the last node from the linked list

9. int main(int argc,char ** argv)

```
{
```

```
void fnstat( );  
for(i=0 ; i<4 ; i++)  
    fnstat( );  
    return 0;  
}  
void fnstat( )  
{  
    static int ia=0;  
    printf("%d",ia);  
    ia++;  
}
```

What is the output of the following code?

- A. 0000
- B. 0123
- C. 0246
- D. 0243

10. What is the output of the C code given below?

```
char *str="\0";  
if(*str)  
    printf("true");  
else  
    printf("false");
```

- A. true
- B. false
- C. compilation error

D. runtime error

11. Which of the following does not initialize ptr to null (assume declaration of A as int A = 0;) ?

- A. `int *ptr = &A;`
- B. `int *ptr = &A - &A;`
- C. `int *ptr = A - A;`
- D. All of the above

12. Examine the following C code given below and answer:

```
#include<stdio.h>
#define N 4
main( )
{
    int a[N] = { 2, 3 } ;
    int b[N-5];
}
```

- A. Program compiles, but gives a run time error
- B. Compile error: array size cannot be a symbol
- C. Compile error: array cannot have negative subscript
- D. Compile error: array not initialized

13. The C Pre-processor does the following things

- A. Macro Expansion

- B. Conditional compilation
- C. Header/source file inclusion
- D. All of the above

14. The memory allocated during COMPILE time is

- A. Dynamic
- B. Static
- C. Automatic
- D. Hybrid

15. `int * ptr=(int *) realloc(NULL,100)` is same as

- A. `int *ptr=(int *) malloc(20)`
- B. `int *ptr=(int *) malloc(50)`
- C. `int *ptr=(int *) calloc(25,4)`
- D. `int *ptr=(int *) calloc(20,4)`

16. An algorithm should have _____

- A. Finiteness
- B. Definiteness
- C. Effectiveness
- D. All of the above

17. The following code

```
x = 10;  
for(i = 1; i <= 100; ++i)  
{
```

```
if (x > 20)
{
    //Do something
}
```

is rewritten as given below

```
x = 10;
if (x > 20)
{
for(i = 1; i <= 100; ++i)
{
    //Do something
}
```

The code tuning technique used here is _____

- A. Jamming the loop
- B. Un-switching the loop
- C. Unrolling the loop
- D. Using sentinel

18. Exhaustive search is done in _____

- A. Greedy Technique
- B. Brute Force technique
- C. Divide & Conquer technique
- D. Dynamic Programming

19. Merge sort algorithm uses _____ technique

- A. Brute force
- B. Dynamic programming
- C. Greedy
- D. Divide and conquer

20. The average case complexity for inserting an element into an array of size n , represented in terms of number of copies is

- A. $O(n^2)$
- B. $O(\log n)$
- C. $O(n)$
- D. 1

21. What is the asymptotic worst case complexity of the given pseudo code
for($i=0; i < n; i++$)

```
{  
  for( $j=0; j < n; j++$ )  
  {  
     $c[i][j]=0$ ;  
    for( $k=0; k < n; k++$ )  
    {  
       $c[i][j]=c[i][j]+a[i][k]*b[k][j]$ ;  
    }  
  }  
}
```

- A. $O(n)$
- B. $O(1)$
- C. $O(n^2)$

D. $O(n^3)$

22. The complexity of Graph coloring (Map coloring) problem is

- A. Linear
- B. Polynomial
- C. Exponential
- D. None of the above

23. Analyse the following code snippet :

```
Class Temp
{
private:
    char m_acEmpName[25];
public:
    char* GetFirstChar()
    {
        strcpy(m_acEmpName, "Hello");
        return this->m_acEmpName;
    }
};

int main(int argc, char ** argv)
{
    Temp oTempObject;
    cout<<oTempObject.GetFirstChar();
    return 0;
}
```

- A. Displays the first character of the string
- B. Displays the complete string Hello
- C. Error
- D. Displays the last character of the string

24. A Class can contain _____

- A. Only the data members
- B. Only the member functions
- C. Both the data members as well as member function
- D. Neither data member nor member functions

25. Consider the following code snippet:

```
#include <iostream.h>
using namespace std;
Class Base
{
    private:
        int m_iData;
    public:
        Base()
        {
            m_iData = 20;
        }
        virtual void show()
        {
            cout << "Base: " << m_iData << endl;
        }
};
Class Derived
```

```
{
public:
    Derived()
    {
        m_iData = 200;
    }
    void show()
    {
        cout << "Derived: "<<m_iData<<endl;
    }
};

int main(int argc, char ** argv)
{
    Derived oDerived;
    oDerived.show();
}
```

What will the output of this program?

- A. Base: 20 Derived: 200
- B. Derived: 200 Base: 20
- C. Base: 20
- D. Derived: 200

26. Assume that the Point class is existing with the following snippet in the header file Point.h:

```
class Point
{
    Point();
    Pont(int, int);
    int GetX();
```

```
int GetY();  
void SetX(int);  
void SetY(int);  
};
```

If the objects of Point are created as Point oPointOne, oPointTwo(2,3);

Which of the following statements are correct?

(i) The statement

```
oPointOne.SetX(20);
```

Will compile and run successfully.

(ii) The statement

```
oPointOne.SetX(20).SetY(30);
```

Will compile successfully but will give a run time error.

- A. Only (i) is correct
- B. Both (i) and (ii) are correct
- C. Both (i) and (ii) are incorrect
- D. Only (ii) is correct

27. What will be displayed when the following code is executed?

```
#include<iostream.h>  
  
class Employee  
{  
public:  
Employee()  
{  
Cout<<"Default Constructor"<<endl;  
}  
};
```

```
int main (int argc, char** argv)
{
    Employee* poEmployee;
    poEmployee = new Employee;
    cout<<"Employee Class pointer created"<<endl;
    return 0;
}
```

- A. 3
- B. Default Constructor
Employee Class pointer created
- C. Nothing is displayed
- D. Employee Class pointer created

28. Analyse the following and choose what is NOT allowed in C++?
Class MyClass

```
{
    int m_iVar1;
    int ProcessVarData();
private:
    float m_fVar;
    void SetFVar(int fVar);
protected:
    int m_iVar2;
}
MyClass::m_iVar1=0;
```

- A. A class cannot have members without access specifier

- B. A non-static data member of a class cannot be defined outside the class
- C. A class cannot have private member function
- D. A class cannot have public data members

29. What will the output of the following program?

```
#include <iostream.h>

int iVal1 = 50;

int& fnSample()
{
    int iVal1 = 20;
    ::iVal1 = iVal1;
    iVal1 = 10;
    return :: iVal1;
}

int main(int argc, char** argv)
{
    int& iRef = iVal1;
    iRef=30;
    iRef=fnSample();
    iRef=40;
    cout<<iRef<<endl;
}
```

- A. 10
- B. 20
- C. 30
- D. 40

30. 'this' pointer is _____.
- A. Pointer to the current object created in all static and non-static methods
 - B. Pointer to the current object created for the current class
 - C. Both A and B
 - D. Pointer to the current object created in all non-static methods
31. Dynamically allocated memory should be freed explicitly, otherwise it leads to _____
- A. Memory Leak
 - B. Memory Fault
 - C. Segmentation Fault
 - D. Dangling Pointers
32. Which topology requires a central controller or hub?
- A. Mesh
 - B. Star
 - C. Bus
 - D. Ring
33. Identify the class of the following IP address : 4.5.6.7
- A. Class A
 - B. Class B
 - C. Class C
 - D. Class D

34. IEEE has defined the specifications for a wireless LAN, called _____ , which covers the physical and data-link layers.

- A. IEEE 802.3
- B. IEEE 802.5
- C. IEEE 802.11
- D. IEEE 802.2

35. Which multiplexing technique transmits digital signals?

- A. WDM
- B. IDM
- C. TDM
- D. CDMA

36. Repeaters function in the _____ layer

- A. Physical
- B. Network
- C. Data link
- D. Transport

37. An IPv4 address consists of _____ bits

- A. 16
- B. 32
- C. 64
- D. 128

38. The access method in bluetooth is _____ .
- A. FDMA
 - B. CDMA
 - C. TDD-TDMA
 - D. None of these
39. In the OSI model, encryption and decryption are functions of the _____ layer
- A. Transport
 - B. Presentation
 - C. Application
 - D. Session
40. _____ may be defined as range of frequencies assigned to a channel
- A. Bandwidth
 - B. Channel Noise
 - C. Bit Rate
 - D. Channel latency
41. The port number used in HTTP is _____
- A. 20
 - B. 21
 - C. 80
 - D. 81
42. Let S and Q be two semaphores initialized to 1, where P0 and P1 processes the following statements:

P0	P1
-----	-----
wait(S);	wait(Q);
wait(Q);	wait(S);
.....
signal(S);	signal(Q);
signal(Q);	signal(S);

The above statement refers to a _____

- A. interrupt
- B. deadlock
- C. semaphore
- D. signal

43. Which one of the following is not shared by threads?

- A. Data
- B. Stack
- C. Code
- D. Files

44. Which one of the following statement is true regarding creation of a thread?

- A. less than the time required to create a new process
- B. equal the time required to create a new process
- C. greater than the time required to create a new process
- D. none of the above

45. To create a process which system call is needed?

- A. open() ;

- B. new();
- C. wait();
- D. fork();

46. The mechanism that bring a page into memory only when it is needed is called

- A. Segmentation
- B. Fragmentation
- C. Page Replacement
- D. Demand paging

47. Virtual memory allows :

- A. Execution of a process that may be completely in memory
- B. A program to be larger than the physical memory
- C. A program to be larger than the secondary storage
- D. Execution of a process without being in physical memory

48. If a page number is not found in the TLB, then it is known as a _____

- A. TLB miss
- B. Buffer miss
- C. TLB hit
- D. TLB not found

49. For 3 page frames, the following is the reference string :

7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1

How many page faults does the LRU page replacement algorithm produce?

- A. 10
- B. 11
- C. 12
- D. 15

50. Round Robin scheduling falls under the category of _____

- A. Non-preemptive scheduling
- B. Preemptive scheduling
- C. Bounded scheduling
- D. Non-bounded scheduling