प्रगत संगणन विकास केन्द्र

Paper Code

B4

CENTRE FOR DEVELOPMENT OF ADVANCED COMPUTING

C-DAC's Common Admission Test (C-CAT) – DECEMBER 2014

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 **Next** 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 **Next** 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 **Next** 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 [Back] 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. #define SQR(x) x*x
   main()
   {
   printf("%d\n",SQR(10+2));
   }

   Output will be

   A. 32
   B. 144
   C. Compilation error
   D. Runtime error

2. Choose the valid statement

   A. All variables are initialized to 0 after declaration
   B. Only local and static variables have junk values
   C. Static and global variables are automatically initialized to zero at the time of declaration
   D. All automatic variables are initialized to zero

3. The following code will have compilation error due to int a[5];

   int *ptr=a++;

   A. A pointer cannot be incremented
   B. Array index out of bounds
   C. Array name is a constant pointer
   D. Array name is a pointer to a constant

4. What is the output of the following code?

```
int account=2;
void main()
{
 static int account;
 printf("%d",account);
}
```

A. 2
B. Garbage value
C. 0
D. Error

5. How many times is the for loop executed?

```
#include <stdio.h>
int main(int argc, char ** argv)
  {
    int iValue;
    for(iValue=0;iValue=3;iValue++)
    printf("%d",iValue);
  }
```

A. 4
B. 3
C. Infinite
D. 0

6. Memory is allocated from _____ for each and every malloc function call

A. Stack
B. Heap

C. Static memory area

D. Cache

7. When is a static variable initialized?

A. Every time the function containing it is called.

B. When it is globally declared.

C. Only when declared within a function.

D. Only the first time the function containing it is called

8. What would be the output of following code?

```
#include<stdio.h>
int main(int argc,char **argv)
{
    int iVar=0, iCnt, aiArr[] = {56,23,4,89,-200,34};
    for(iCnt = 1; iCnt <6; iCnt++)
    {
        if(aiArr[iCnt] < aiArr[iVar])
        iVar = iCnt;
     }
     printf("%d",iVar);
     return 0;
}
```

A. 4

B. 89

C. 3

D. -200

9. What would be the output of following code?

```
#include<stdio.h>
main(int argc, char **argv)
{
 int iCnt,aiArr[5] = {10,20,30,40,50};
 for (iCnt =0; iCnt<4; iCnt ++)
 {
 aiArr[iCnt+1] = aiArr[iCnt];
 }
 for(iCnt = 0; iCnt<5; iCnt++)
 printf("%d  ",aiArr[iCnt]);
 return 0;
}
```

A. 10 20 30 40 50
B. 10 10 10 10 10
C. 10 10 10 10 50
D. 10 10 20 30 40

10. Which of the following are valid cases for switch statement?

(i). -200
(ii). 3*5+2
(iii). a*5+2
(iv). 'x'

A. (i), (ii), (iii) and (iv)
B. (i), (ii) and (iv)
C. (i) and (iv)
D. (ii) and (iv)

11. What would be the output of following code?

```
#include<stdio.h>
void fnOp(char acArr[])
{
    char cTemp;
    cTemp = acArr[0];
    acArr[0] = acArr[2];
    acArr[2] = cTemp;
}
int main(int argc, char **argv)
{
    char acArr[] = "E&R";
    fnOp(acArr);
    printf("%s",acArr);
    return 0;
 }
```

A. E&R
B. R&E
C. E&E
D. R&R

12. What is the output of following program?

```
#include<stdio.h>
int main(int argc,char** argv)
  {
    int iIndex=3;
    for(iIndex = 3;iIndex >= 0;iIndex--)
      {
        switch(iIndex)
          {
```

```
                case 1 : printf("Hi ");
                case 2 : printf("Welcome ");
                break;
                case 3 : continue;
                default: printf("Goodbye ");
            }
        }
          return 0;
    }
```

A. Compile time error because continue cannot be put into switch case statement
B. Welcome Hi Welcome Goodbye
C. Welcome Hi Goodbye
D. Goodbye Welcome Hi Goodbye

13. Which of the following are good coding practices?

(i) To divide the problem statement into different modules/functions.
(ii) To have a distinct looking pattern for all debug log lines.
(iii) To have a pair of curly brace for control structures even if there is only one statement.

A. (i), (ii) and (iii)
B. (i) and (ii)
C. (ii) and (iii)
D. (i) and (iii)

14. What will happen if the below program is executed?

```
#include <stdio.h>
int main()
{
   int main = 7;
```

```
    printf("%d", main);
    return 0;
}
```

A. It will cause a compile-time error
B. It will cause a run-time error
C. It will run without any error and prints 7
D. It will experience infinite looping

15. The initial value of an uninitialized local variable will be _____

A. 0
B. Garbage value
C. 1
D. -1

16. The order of the following expression:

3X^3 + 200.X + 40 is

A. O(X^3)
B. O(X^2)
C. O(X log X)
D. O(log X)

17. Big O notation is defined for

A. Time and Space Complexity
B. Optimality
C. Searching
D. Sorting

18. Which of the following function declaration is illegal?

A.
```
double func();
int main(){}
double func(){}
```

B.
```
double func(){};
int main(){}
```

C.
```
int main()
{
double func();
}
double func()
{ //statements }
```

D. None of the above

19. The effectiveness of an algorithm is best stated in

A. Best-case Time
B. Average-case Time
C. Worst-Case running time
D. Industry-Standard Time

20. What is the complexity of this algorithm?

```
Algorithm Sum(a,n)
{
  s := 0.0;
  for i := 1 to n do
     s := s + a [i];
  return s;
}
```

A. $\log_2 n$
B. O(n)
C. O(n logn)
D. $O(k^n)$

21. The order of magnitude of the algorithm is

```
Algorithm Add(a,b,c,m,n)
 {
       for i:= 1 to m do
         for j:= 1 to n do
           c[i,j]:= b[i,j] + a [i,j];
 }
```

A. m^n
B. log mn
C. m*n
D. log (m^n)

22. The term "push" and "pop" is related to the _____

A. Queue
B. Stack
C. Linked List
D. Tree

23. When class B is inherited from class A, what is the order in which the constructers of those classes are called?

A. Class A first Class B next
B. Class B first Class A next

C. Class B's only as it is the child class

D. Class A's only as it is the parent class

24. The _____ functions of the base class are not inherited

A. Pure virtual

B. Virtual

C. Friend

D. Both (A) and (B)

25. Which of the following is not a type of constructor?

A. Copy constructor

B. Friend constructor

C. Default constructor

D. Parameterized constructor

26. Which of the following statement is true?

A. We can access private members outside the class

B. We can access private members inside derived class

C. We can access protected member inside non-member class

D. We can access protected member inside derived class

27. What happens when the following piece of code in file1.c, is compiled and executed?

```
namespace
{
   Class Temp
   {
     public:
```

```
      int GetVal()
      {
       return 100;
      }
   };
} //end of namespace

int main()
{
 Temp oTempObj1;
 Cout<<oTempObj1.GetVal()<<endl;
}
```

A. Compile Error
B. 100
C. Runtime Error
D. Compilation Error

28. Iterators are _____

A. Generalised pointers in STL
B. Container classes in STL
C. Algorithms in STL
D. Special Methods in STL

29. Analyse the following code snippet and choose the answer:-

```
#include <stdio.h>
Class Temp
{
 private:
   int m_ival;
 public:
```

```
    Temp()
     {
       Cout<<"OBJECT CREATED\n"<<endl;
     }
    ~Temp()
    {
       Cout<<"OBJECT DESTROYED\n"<<endl;
    }
};
void fnRead()
{
 Temp oTempObj;
}
int main()
{
 fnRead();
 cout<<"IN MAIN \n"<<endl;
 return 0;
}
```

A. OBJECT CREATED
   OBJECT DESTROYED

B. OBJECT CREATED
   OBJECT DESTROYED
   IN MAIN

C. OBJECT CREATED
   IN MAIN

D. Compilation Error

30. Can two independent classes contain member functions with the same name?

A. No.
B. Yes, but only if the two classes belong to different namespaces
C. Yes, but only if the two classes are within the same namespace
D. Yes, this is always allowed

31. In _____ programming techniques, Modules are tightly coupled.

A. Unstructured
B. Object-Oriented
C. Assembly Language
D. Procedure-Oriented

32. Which physical network topology is used by the Ethernet technology?

A. Star
B. Bus
C. Tree
D. Mesh

33. Identify the class of IP address 229.1.2.3

A. Class A
B. Class B
C. Class C
D. Class D

34. The file transfer protocol is built on _____

A. Data Centric Architecture
B. Service Oriented Architecture

C. Client Server Architecture

D. Peer to peer Architecture

35. _____ refers to the physical or logical arrangement of a network.

A. Data flow

B. Mode of operation

C. Topology

D. Interconnectivity

36. Which layer functions as liaison between user support layers and network support layers?

A. Network layer

B. Physical layer

C. Transport layer

D. Session layer

37. What does the server HTTP error code 404 mean?

A. Unauthorised

B. Not Found

C. Forbidden

D. Request Timeout

38. The _____layer changes bits into electromagnetic signals.

A. Physical

B. Data link

C. Transport

D. Application

39. Conversion of Domain Name to IP address is done by

A. DHCP
B. DNS
C. VPN
D. Proxy Servers

40. The default port for SSH client connections is _____

A. 20
B. 21
C. 22
D. 23

41. IPv6 address is a _____

A. 16 bit address
B. 32 bit address
C. 64 bit address
D. 128 bit address

42. Which scheduling algorithm is ana example of non-preemptive scheduling.

A. FCFS scheduling
B. SJF scheduling
C. RR scheduling
D. Priority Scheduling

43. State which statement is true:-

i) Switching the CPU to another process requires saving the state of the old process and loading the saved state for the new process is called context switching.
ii) The long-term scheduler executes much less frequently.
iii) As processes enter the system, they are put into a job queue.

A. i)

B. i) and ii)

C. ii) and iii)

D. i), ii) and iii)

44. When there is enough memory to fit a process, but the memory space is non-contagious, this situation is called _____

A. Internal Fragmentation

B. External Fragmentation

C. Virtual Fragmentation

D. Segmentation

45. The size of a page is typically _____

A. Varied

B. Power of 2

C. Power of 4

D. Power of 8

46. If a process is executing in its critical section, then no other processes are permitted to execute in their critical section. This phenomena is called_____

A. Mutual Exclusion

B. Critical Exclusion

C. Synchronous Exclusion

D. Asynchronous Exclusion

47. The concept of bringing page into memory for execution only when it is needed is termed as _____

A. Page Swapping
B. Page Fault
C. Page Synchronization
D. Demand Paging

48. In the waiting state _____

A. The processes are waiting for I/O in the I/O queue
B. The processes which are running are listed
C. The processes waiting for the CPU burst are listed
D. The processes are in blocked state

49. Observe the statement and choose the correct option: - The solution possible for critical section problem is only mutual exclusion.

A. True
B. False
C. Contradictory
D. None of these

50. In the context of CPU utilization, the number of processes completed per unit cycle of time is called as _____

A. Efficiency
B. Turnaround time
C. Response Delay
D. Throughput