# iiO'13 

# International Informatics Olympiad 2013 

Organized by Computer Literacy Foundation, New Delhi, India

## QUESTION PAPER



Read the following instructions carefully before you begin to answer the questions in the OM R Answer Sheets provided along with this question paper. Ask the Examination In-charge/Invigilator how to mark the OM R Answer Sheets, in case you have any doubts.
NOTE: Marking improper STREAM POINTNO. 11 in the OMR SHEET may lead inappropriate/ non-availability of result.

## INSTRUCTION TO CANDIDATES TO BE EXPLAINED BY THE INVIGILATORS

1. This Booklet contains 100 questions in all comprising the following 6 Sections:

| Section-A | Fundamental of Computer Science | (15 Questions) | 2.5 M arks each |
| :--- | :--- | :--- | :--- |
| Section-B | Computer Science (C++) | (20 Questions) | 2.5 Marks each |
| Section-C | Informatics Practices (Java) | (20 Questions) | 2.5 Marks each |
| Section-D | Python | (20 Questions) | 2.5 Marks each |
| Section-E | Multimedia \& Web Technology | (20 Questions) | 2.5 Marks each |
| Section-F | Mental Abality | (05 Questions) | 2.5 Marks each |

## Section A and F are compulsery for all students. Opt any one from Section B, C, D \& Section E.

2. This Booklet contains 10 pages. Please check, if any page is misprintied, missing or repeated.
3. Collect your OM R Answer Sheets from the Invigilator/Examination In-Charge to answer the questions given in this Booklet.
4. You must fill all the necessary information's which are required in the space provided in this booklet and OMR Answer Sheet.
5. Correct Answers must be marked by "Darkening" the corresponding circles on the OM R Answer Sheet, against the relevant question number with Pencil or Blue/ Black, Ball point Pen only. Answers which are not darkened in circle will not be awarded with any mark.
6. No rough work is to be done in the OM R Answer Sheet.
7. Mobile Phones and other Wireless equipments are banned in the examination halls/rooms.
8. OMR Answer Sheets must be handed over to the Examination In-charge/Invigilator before you leave the examination room/hall and recheck that you have filled all the required informations.
9. The results will be published in our web-site WWW.SILVERZONE.ORG in the month of Jan 2014. You can check it with your 12 digit Roll Number provided in the Enrollment Ticket.
TEACHERSARE REQUESTED TO CHECKIF THE REQUIRED INFORM ATIONSARE PROPERLYFILLED BYTHE CANDIDATESIN THE QUESTION PAPER \& OM R ANSWER SHEETS, AND ALSO ENSURE THAT OM R ANSWER SHEETS ARE PROPERLY M ARKED. PLEASE SEND USBACK THE OM R ANSWER SHEETSONLY.

## SECTION - A <br> Fundamental of Computer Science

1. In the HDD architecture, which one of the following terms best describe the number of revolutions of the plates of the drive engine?
(A) Arm speed
(B) Revolution speed
(C) Engine speed
(D) Both (A) and (C)
(E) None of these
2. Which one of the following is known as the logical area on the hard disk where files are kept.
(A) Directory/Folder
(B) My Documents
(C) My Network Places
(D) All of the above
(E) None of these
3. Which one of the following is the disadvantage of an analog computer?
(A) It requires digital signal to work
(B) It does not give accurate output
(C) It requires large volume of memory
(D) All of these
(E) None of these
4. Which one of the following is termed as the combination of hardware and software?
(A) Liveware
(B) Firmware
(C) Skinware
(D) System software
(E) None of these
5. Semiconductor memories are electronic data storage. They are made up of $\qquad$ -'
(A) Copper
(B) Iron
(C) Silicon
(D) Plastic
(E) None of these
6. S/ MIME in Internet technology stands for?
(A) Secure M ultipurpose Internet $M$ ail Extension
(B) Secure Multimedia Internet M ail Extension
(C) Simple M ultipurpose Internet M ail Extension
(D) Simple M ultimedia Internet M ail Extension
(E) None of these
7. From what location are the 1st computer instructions available on boot up?
(A) ROM BIOS
(B) win.ini
(C) boot.ini
(D) CONFIG.SYS
(E) None of the above
8. RAID is reliable data storage. RAID technology combines more than one hard disk in an array. The full form of RAID is. $\qquad$
(A) Redundant Array of Inexpensive Disk
(B) Redundant Array of Index Disk
(C) Redundant Array of Interactive Disk
(D) Redundant Array of Imperative Disk
(E) None of these
9. $\qquad$ is the time required between the requests made for read/ write operation and the time it takes for the completion of the request.
(A) Achieved Time
(B) Action time
(C) Actual time
(D) Access time
(E) None of these
10. Which one of the following is a region of memory used to hold data temporarily while it is being moved from one place to another?
(A) Buffer
(B) RAM
(C) ROM
(D) Page file
(E) None of these
11. Which of these are the $\mathbf{5}$ generic software engineering framework activities?
(A) Communication, planning, modelling, construction, deployment
(B) Communication, risk management, measurement, production, reviewing
(C) Analysis, designing, programming, Debugging, maintenance
(D) Analysis, planning, designing, programming, testing
12. The hexadecimal number system consists of the following symbols $\qquad$ .
(A) 0-7
(B) $0-9$
(C) $0-9, \mathrm{~A}-\mathrm{F}$
(D) All of these
(E) None of these
13. A plotter is a computer printing device for printing vector graphics. Plotter's accuracy is measured in terms of repeatability and $\qquad$ -
(A) Buffer size
(B) Resolution
(C) Vertical dimensions
(D) Intelligence
(E) None of these
14. The part of operating system which directly makes interface with hardware system is called:
(A) Utilities
(B) Kernel
(C) Virtual M achine
(D) BIOS
(E) None of these
15. Protocol is :
(A) software that facilitates connection to the internet
(B) a list of rules for transferring data over a network
(C) software that allows file copying
(D) a gateway calling program for internet bridging
(E) None of these

## SECTION - B Computer Science (C++)

16. What will be the output of the following C++ code:
void main()
\{int val =8;
cout <<++val<<"|t" <<val- -<<"|t"<<val; \}
(A) 898
(B) 888
(C) 988
(D) 889
(E) None of these
17. Select the logical operator from the following:
(A) !
(B) $=$
(C) $<$
(D) $>=$
(E) None of these
18. Which of the following statement is/ are correct?
(A) By default the member of a class are private
(B) By default the member of a structure are public
(C) By default the member of a class are protected
(D) Both A and B
(E) All of these
19. Write the output of the following code:
void main ()
\{
int $m, n=0$;
for ( $m=1 ; m<=6 ; m+$ )
\{
if ( $m<=4$ )
continue;
$\mathrm{n}+=\mathrm{m}$ :
cout $\ll \mathrm{m} \lll "|\mathrm{t} " \ll n \ll "| \mathrm{t} " ;$
\}
\}
(A) 112336410510610
(B) 1122336410515621
(C) 5060
(D) 55611
(E) None of these
20. How many maximum elements can reside in array a[10][2] ?
(A) 20
(B) 10
(C) 200
(D) 30
(E) None of these
21. Which header file is required for clrscr() in a c++ program
(A) losteram.h
(B) Conio.h
(C) Math.h
(D) Both A and B
(E) None of these
22. A program can be terminated at any time by calling the function:
(A) fflush()
(B) ferror()
(C) exit()
(D) clearer()
(E) None of these
23. What is correct sequence of switch command
(A) Switch, Case, Break, Default
(B) Switch, Break, Case, Default
(C) Switch, Case, Default, Break,
(D) All of the above
(E) None of these
24. Which of the following concepts means determining at runtime what method to invoke?
(A) Data hiding
(B) Dynamic Typing
(C) Dynamic binding
(D) Dynamic loading
(E) None of these
25. Which of the following function prototype is perfectly acceptable?
(A) int Function(int Tmp =Show ());
(B) float Function(int Tmp =Show(int, float));
(C) Both A and B .
(D) float =Show(int, float) Function(Tmp);
(E) None of these
26. Which of the following is not user defined data type?
1: struct book
\{
char name[10];
float price;
int pages;
\};
2: long int I = 2.35;
3: enum day \{Sun, M on, Tue, Wed\};
(A) 1
(B) 2
(C) 3
(D) Both 1 and 2
(E) None of these
27. Where the default value of parameter have to be specified?
(A) Function call
(B) Function definition
(C) Function prototype
(D) Both B or C
(E) None of these
28. Observe the following C++ code and select the correct output produced by it:
void $X$ (int \&A, int \&B )
\{
$A=A+B ;$
$B=A-B ;$
$A=A-B$;
\}
void main()
\{
int $a=4, b=8$;

X(a,b);
cout $\ll a \lll ", "<b$;
\}
(A) 4,8
(B) 4,4
(C) 8,4
(D) 8,8
(E) None of these
29. Constructor is special because its name is same as the class name. Which of the following is/ are type of constructor?
(A) Default Constructor
(B) Parameterized Constructor
(C) Copy Constructor
(D) All of these
(E) None of these
30. A function is a group of statements that is executed when it is called from some point of the program. A C+ program always begins its execution by the $\qquad$ function.
(A) call
(B) call by value
(C) main
(D) all of these
(E) none of these
31. What is used to convert $\mathrm{C}++$ source code into object modules?
(A) Compiler
(B) Assembler
(C) Linker
(D) All of these
(E) None of these
32. Polymorphism is the key concept of object oriented programming. Which of the following is/ are type(s) of polymorphism?
(A) Function overloading
(B) Operator overloading
(C) Inheritance
(D) Both A and B
(E) None of these
33. Which of the following statement is correct?
(A) The order of the default argument will be right to left.
(B) The order of the default argument will be left to right.
(C) The order of the default argument will be alternate.
(D) The order of the default argument will be random.
(E) None of these
34. Find the output :
void main()
\{int a=10,sum $=0$;
for(int cnt=0; cnt<=a; cnt++)
\{if(cnt\%2=0)
cnt=cnt+2;
else
cnt=cnt+1; $\}$
sum+=cnt;
cout<<sum;
\}
(A) 12
(B) 14
(C) 11
(D) 15
(E) None of these
35. main() is an example of:
(A) library function
(B) user-defined function
(C) header
(D) statement
(E) None of these

## SECTION-C

 Informatics Practices (Java)16. Which of the following keyword is an access specifier that allows programmer to control the visibility of class members?
(A) Class
(B) Public
(C) Continue
(D) Extends
(E) None of these
17. What will be the output of the program?
public class Foo
\{
public static void main(String[] args)
\{
try
\{
return;
\}
finally
\{

System.out.printIn("Finally");
\}
\}
\}
(A) Finally
(B) Compilation fails.
(C) The code runs with no output.
(D) An exception is thrown at runtime.
(E) None of these
18. Consider the following code:
class example
\{
public static void main(String args[])
\{
System.out.printIn("This is simple java program");
System.out.printIn("Java is an object oriented programming language");
\}\}
Which one of the following is used to compile the above code?
(A) javac example.java
(B) java example.java
(C) java example
(D) java example.java
(E) None of these
19. What will be the output of the following program?
class sample1
\{
public static void main(String args[])
\{
int x , y , result;
float a, p;
$\mathrm{x}=45$;
$y=20 ; \quad a=8.5 ;$
result=x+a;
$p=y+a ;$
System.out.printIn("x+a: " rresult);
System.out.println("y+a:" +p );
\}
\}
(A) $x+a: 53$
(B) $x+a: 53.5$
$y+a: 28$
(C) $x+a: 53.5$
(D) $x+a: 53$
$y+a: 28.5$
$y+a: 28.5$
(E) None of these
20. The Java programming language is a high-level language. Which of the following is/ are feature(s) of Java?
(A) Object oriented
(B) Distributed
(C) Multithread
(D) Dynamic
(E) All of these
21. Constructor overloading is a technique in Java. can have any number of constructor with different parameter.
(A) Struct
(B) Union
(C) Class
(D) All of these
(E) None of these
22. Which of the following features of java allows you to acquire the properties of parent class by its child class?
(A) Inheritance
(B) Function overloading
(C) Encapsulation
(D) Data abstraction
(E) None of these
23. Examine the following code snippet:
public class M a inClass \{
public static void main(String args[]) \{
int i, k;
$i=-10 ;$
$k=i<0$ ? - i : i; // get absolute value of i
System.out.print("Absolute value of ");
System.out.println( $\mathrm{i}+$ " is " +k );
\}
\}
What will be the output?
(A) Absolute value of 10 is -10
(B) Absolute value of -10 is 10
(C) Absolute value of 10 is 10
(D) It generates runtime error
(E) None of these
24. Which of the following is/ are branching statements in Java?
(A) Break
(B) Continue
(C) Switch
(D) All of these
(E) Both A and B
25. JFC stands for:
(A) Java Foundation Classes
(B) Java Fundamentals Classes
(C) Java First Classes
(D) Java Find Classes
(E) None of these
26. Consider the following code:
class demo \{
public static void main(String args[])
\{ int $x=15$;
if $(x=15)$
\{
int $y=10 ; \quad$ int result;
Result=x+y;
System.out.printIn("The value of $x+y$ is " tresult);
\}
$y=y+1 ;$
$x=x+1$
\}\}
(A) The program will not compile successfully it will produce error
(B) The value of $x+y$ is 25
(C) The value of $x+y$ is 10
(D) The program will compile successfully but produce no output
(E) None of these
27. Examine the following code snippet:
int $n=10$;
if( $n++\% 2==0)\{$
System.out.println("Even");
\}
else \{
System.out.println("Odd");
\}
What will be the output?
(A) Even
(B) Odd
(C) No output
(D) Both A and B
(E) None of these
28. Which of the following statements is correct about applets in java?
(A) An applet is an application designed to be transmitted over the internet and executed by a Java compatible Web browser.
(B) An applet is a tiny java program and dynamically downloaded across the network.
(C) An applet is an intelligence program not just an animation or media file and all applets are the application but all application are not the applets
(D) All of these
(E) None of these
29. In $\qquad$ a table in 2NF and every non-key attribute is functionally dependent only on the primary key.
(A) 1 NF
(B) 3 NF
(C) 2 NF
(D) All of these
(E) None of these
30. The Java language initially called as:
(A) Perl
(B) Woak
(C) Oak
(D) Holf
(E) None of these
31. John writes the following code:
class example
\{
public static void main(String args[])
\{
Syste.out.printIn("This is a simple java program"); \} \}
And save it with example.java file name. Which of the following file contains the byte code version of the program that created by java compiler?
(A) example.java
(B) example.class
(C) example.javac
(D) example.exe
(E) None of these
32. From the following which one is not a DDL command:
(A) CREATE
(B) DELETE
(C) ALTER
(D) RENAME
(E) None of these
33. Which one of these lists contains only Java programming language keywords?
(A) class, if, void, long, Int, continue
(B) goto, instanceof, native, finally, default, throws
(C) try, virtual, throw, final, volatile, transient
(D) strictfp, constant, super, implements, do
(E) byte, break, assert, switch, include
34. Which will legally declare, construct, and initialize an array?
(A) int [] myList =\{"1", "2", " 3 " \};
(B) int [] myList $=(5,8,2)$;
(C) int myList [][] $=\{4,9,7,0\}$;
(D) int myList [] $=\{4,3,7\}$;
(E) None of these
35. public class Test \{\}

What isthe prototype of the default constructor?
(A) Test()
(B) Test(void)
(C) Public Test()
(D) Public Test(void)
(E) None of these

## SECTION - D Python

16. What does the following code do?
def a(b, c, d): pass
(A) defines a list and initializes it
(B) defines a function, which does nothing
(C) defines a function, which passes its parameters through
(D) defines an empty class
(E) None of these
17. What gets printed? Assuming python version 2.x
print type(1/2)
(A) đype 'int'>
(B) đype 'number’>
(C) «ype 'float'>
(D) «ype 'double’>
(E) đype 'tuple'>
18. What is the output of the following code?
print type([1,2])
(A) đype 'tuple'>
(B) 〈ype 'int'>
(C) ¿ype 'set'>
(D) 屯ype 'complex'>
(E) «ype 'list'>
19. What gets printed?
$\operatorname{deff():~pass~}$
print type(f())
(A) đype 'function'>
(B) đype 'tuple'>
(C) «ype 'NoneType’>
(D) đype 'str'>
(E) đype 'type’>
20. What should the below code print?
print type(1))
(A) đype 'complex'>
(B) «ype ‘unicode’>
(C) ¢ype'int’>
(D) đype 'float'>
(E) $\Varangle y p e$ 'dict'>
21. What is the output of the following code? print type(lambda:None)
(A) đype 'NoneType’>
(B) đype 'tuple'>
(C) đype 'type’>
(D) đype 'function'>
(E) đype 'bool'>
22. What is the output of the below program?
$a=[1,2,3$, None,(),[],]
print len(a)
(A) syntax error
(B) 4
(C) 5
(D) 6
(E) 7
23. Suppose $t=(1,2,4,3)$, which of the following is incorrect?
(A) $\operatorname{print}(t[3])$
(B) $t[3]=45$
(C) $\operatorname{print}(\max (\mathrm{t}))$
(D) print(len(t))
(E) $\operatorname{print}(\operatorname{sum}(t))$
24. Suppose $t=(1,2,4,3), t[1: 3]$ is $\qquad$ .'
(A) $(1,2)$
(B) $(1,2,4)$
(C) $(2,4)$
(D) $(2,4,3)$
(E) $(1,2,4,3)$
25. You can use $\qquad$ to create an empty set.
(A) $\}$
(B) ()
(C) []
(D) set()
(E) None of these
26. What will be displayed by the following code?
$d=\{$ "john": 40, "peter": 45$\}$
print(list(d.keys()))
(A) ["john", "peter"]
(B) ["john":40, "peter":45]
(C) ("john", "peter")
(D) ("john":40, "peter":45)
(E) None of these
27. Which of the following is a Python list?
(A) $[1,2,3]$
(B) $(1,2,3)$
(C) $\{1,2,3\}$
(D) $\{$
(E) None of these
28. In Python, a syntax error is detected by the _-_---_- at at $\qquad$ _.
(A) compiler/at compile time
(B) interpreter/at runtime
(C) compiler/at runtime
(D) interpreter/ at compile time
(E) None of these
29. Which of the following is a Python set?
(A) $[1,2,3]$
(B) $(1,2,3)$
(C) $\{1,2,3\}$
(D) $\}$
(E) None of these
30. To start Python from the command prompt, use the command $\qquad$ -
(A) execute python
(B) run python
(C) python
(D) go python
(E) None of these
31. What is round(6.5)?
(A) 4
(B) 5
(C) 6
(D) 7
(E) 8
32. Which of the following is the correct expression of character 4 ?
(A) 4
(B) " 4 "
(C) '4'
(D) None of these
33. In Python, a string literal is enclosed in
$\qquad$
(A) parentheses
(B) single-quotes
(C) double-quotes
(D) Both (B,C)
(E) None of these
34. Suppose $x$ is a char variable with a value ' $b$ '. What will be displayed by the statement print( $\operatorname{chr}(\operatorname{ord}(\mathrm{x})+1)$ )?
(A) a
(B) b
(C) c
(D) $d$
(E) None of these
35. Which of the following statement prints smith $\backslash$ exam1 1 test.txt?
(A) print("smith exam1 \test.txt")
(B) print("smith<br>exam1<br>test.txt")
(C) print("smith "exam1 $\$ "test.txt")
(D) print("smith"\exam1"\test.txt")
(E) None of these

## SECTION - E

## Multimedia \& Web Technology

16. What is the correct HTML tag for inserting a paragraph break?
(A) $\langle p>$
(B) 〈break>
(C) $\langle\mathrm{br}>$
(D) $\langle\mathrm{r}>$
(E) None of these
17. What is the correct HTML for making a hyperlink?
(A) 孔href $a=$ "http:/www.sz.com">sz.com<a>
(B) <a href="http://www.sz.com">dps</a>
(C) <a>http://www.sz.com</a>
(D) <a name="http:// www.sz.com">sz.com </a>
(E) None of these
18. What would be the output of the following Code?
<ccript type="text/vbscript">
i=0
do while i <2
document.write(i \& ",")
i $=+1$
loop
<script>
(A) $0,1,2$
(B) 0,1 ,
(C) Error in Script
(D) Nothing will be printed
(E) None of these
19. What does CSS stand for?
(A) Cascading Style Semantics
(B) Cascading Specification Sheets
(C) Cascading Software Sheets
(D) Cascading Style Sheets
(E) None of these
20. In the code <frameset cols="120,*"> the following would be true.
(A) Right frame would be 120 pixels high
(B) Left frame would be 120 pixels wide
(C) Top frame would be 120 pixels high
(D) Left frame would be 120 inches wide
(E) None of these
21. What is the correct syntax for the presentation of comments in XML document?
(A) <-- Comment-->
(B) $\langle/$ Comment-->
(C) <?--Comment-->
(D) <?:Comment-->
(E) None of these
22. HTML uses markup tags to describe web pages.

Which of the following is/ are HTML attributes?
(A) class
(B) id
(C) style
(D) title
(E) All of these
23. What is a URL:
(A) An email address
(B) The title of a web site
(C) The address of a page on the World Wide Web
(D) A communication method between computers and printers
(E) None of these
24. How can you make a list that lists the items with numbers?
(A) <01>
(B) $\langle\mathrm{dl}>$
(C) $\langle\mathrm{ul>}$
(D) বist>
(E) None of these
25. What is the correct HTML for making a text input field?
(A) «extinput type="text">
(B) «extfield>
(C) <inputtype="textfield">
(D) <nput type="text">
(E) None of these
26. Which color combination produces BLUE color?
(A) Yellow \& Magenta
(B) Yellow \& Cyan
(C) Magenta \& Cyan
(D) M agenta \& Black
(E) None of these
27. Which technique is referred to as inline scripting?
(A) The use of SCRIPT tags in line with the HEAD and BODY tags.
(B) The addition of the INLINE tag within the controlling HTM L.
(C) The embedding of scripting instructions within certain HTML tags.
(D) The physical justification of the script (major routines on the left, and lesser routines indented and on the right).
(E) None of these
28. JavaScript usually runs on the client-side (the browser's side), as opposed to server-side. What is/ are the common use(s) of JavaScript?
(A) Alert messages
(B) Popup windows
(C) Dynamic dropdown menus
(D) Form validation
(E) All of these
29. Which colors consist of equal amounts of all basic colors?
(A) purple, green, and red
(B) black, blue, and gray
(C) white, red and gray
(D) white, black and gray
(E) None of these
30. Which one of the following is used for group declaration and statements for a compound statement or a block while declaring if statement?
(A) $\}$
(B) $($,
(C) $\}$
(D) []
(E) None of these
31. Microprocessors vary according to their inbuilt specifications and enhanced qualities. Which one of the following is not a type of Microprocessor Chip?
(A) Pentium
(B) Intel
(C) AMD
(D) Celeron
(E) None of these
32. To select the unselected area in photoshop document
(A) Use SELECT menu ->Inverse
(B) Use SELECT menu ->Transform Selection
(C) Use SELECT menu ->Load selection
(D) Use SELECT menu ->Similar
(E) None of these
33. What does vlink mean ?
(A) active link
(B) very important link
(C) visited link
(D) valid link
(E) None of these
34. Which one of the following operator is used to compare data with a NULL value?
(A) NULL
(B) IS NULL
(C) BETWEEN
(D) IN
(E) None of these
35. Which of the following templates are available with the Professional edition of Visual Basic 6.0?
(A) VB Application Wizard
(B) ActiveX EXE
(C) ActiveX DLL
(D) Data Project
(E) Both b and c

## SECTION - F <br> Mental Abality

36. Fill the blank space with correct option. B 8 D 9 G 17 K 44 P 10 .......
(A) 33
(B) U
(C) V
(D) W
(E) None of these
37. Which of the following is the odd man?
(A) Asafoetida
(B) Ginger
(C) Wheat
(D) Coriander
(E) None of these
38. Which of the following options is unfit for the series given below?
Nn Ss PP Tt Ff Gg Hh
(A) Ff
(B) Ss
(C) Gg
(D) PP
(E) None of these
39. Find the missing number.

315340 ....... 390415
(A) 370
(B) 345
(C) 355
(D) 365
(E) None of these
40. If code of 'FTNO' is 'GUST', then find the code of 'BPHU'.
(A) CZMQ
(B) CQMZ
(C) CM ZQ
(D) CMQZ
(E) None of these

