

Roll No. _____

Code : 112016-083-A

Please check that this question paper contains 7 questions and 7 printed pages.

CLASS-XI
COMPUTER SCIENCE

Time Allowed : 3 Hrs.

Maximum Marks : 70

General Instructions :

All the questions are compulsory.

The paper contains 7 questions.

Programming language used : C++

S. No.	Sub Part	Question	Marks
1.	(a)	Why is Mobile operating system Android more popular ?	(1)
	(b)	Expand GUI and BOSS.	(1)
	(c)	What utilities / programs will you use to perform the following tasks :	(2)
		(i) Reduce the size of files so that it becomes easier to transmit them on the network.	
		(ii) Scan the hard disk for fragmented files and bring all the fragments together to optimise storage.	
	(d)	Convert the following :	(4)
	(i) $(C92)_{16} = (?)_2$		
	(ii) $(10111.101)_2 = (?)_{10}$		
	(iii) $(1011.001)_2 = (?)_8$		
	(iv) $(44)_{10} = (?)_{16}$		
	(e)	Differentiate between Booting and POST (Power On Self Test)	(2)
2.	(a)	(i) Declare a variable that keeps a constant value 30 that cannot be altered later on.	(3)
		(ii) Declare a variable that can store a name with at most 20 alphabets.	
		(iii) Declare an integer identifier which can never take a negative value	
(b)	Convert the following single conditional statement to if-else : <code>disc = (qty > 50) ? 10 : 0;</code>	(2)	

	<p>(c) Write a program in C++ that takes Height in inches as input and display the height in feet and inches. e.g. if the input is :28 the output should be: 2 feet 4 inches. (3)</p> <p>(d) Identify the type of errors. (2)</p> <p>(i) <code>cout >> "b";</code> (ii) <code>x = 0; y = 20/x;</code></p> <p>(e) Name two entry controlled loops. (1)</p> <p>(f) What is self documenting code ? (1)</p>	
3.	<p>(a) Give the output of the following code fragment (2)</p> <pre>int c1,c2; int a= -8; int b=3; c1 = -- a+b; c2=a -- +b; cout<<"c1= "<<c1 <<","<< "c2 = "<<c2<<endl;</pre> <p>(b) Observe the following C++ code carefully and rewrite the same after removing all the syntax error(s) present in the code. Ensure that you underline each correction in the code. (2)</p> <p>Important Note:</p> <ul style="list-style-type: none"> - All the desired header files are already included, which are required to run the code. - Correction should not change the logic of the program. <pre>#include(iostream.h) #define SIZE =3; void main() { int a[SIZE]={10,20,30,40,50}; float x=2; for (i=0, i<SIZE, i++) cout<<a[i]%x; }</pre> <p>(c) Write the name of the header files which is/are essentially required to run/execute the following C++ code : (2)</p>	

	<pre>void main() { char ch, word[] = "Magic Box"; for(int i= 0; word[i] != '\0' ; i++) if (word[i] == ' ') cout<<endl; else { ch = tolower(word[i]; cout<<ch; } </pre> <p>(d) Determine the number of bytes required to store STOK in C++ with following description : (2)</p> <ul style="list-style-type: none"> • Icode (Item code, integer) • Iname (Item name, string of 10 characters) • Itype (Item type, Character) • Price (price of each item, float) <p>(e) Construct logical expressions to represent the following conditions : (2)</p> <p>(i) salary is not in the range 6000 to 7000</p> <p>(ii) ch is a lowercase alphabet</p> <p>(iii) gender is 'm'</p> <p>(iv) a is not equal to 0 or less than 0.</p> <p>(f) Write a program in C++ to input a character and check and print if it is a digit or non-digit. (2)</p>	
4.	<p>(a) How many times "hello" will be printed in the following code fragment? Give reason. (2)</p> <pre>for (i = 0; i < 5; i++); cout << "hello";</pre> <p>(b) Rewrite the following code using switch-case. (3)</p> <pre>char designation; cin>> designation; if (designation == 'H') cout <<"Head of School"; else if (designation == 'T') cout << "Teaching Staff"; else if (designation == 'A') cout <<"Admin Department";</pre>	

	<p>(c) Give the output of the following C++ program :</p> <pre> for (int i = 1; i<=5; i++) { for (int j=i; j<=5; j++) cout <<i<<"@"; cout <<endl; } </pre>	(3)
	<p>(d) When do we require a repetitive control structure “do-while” instead of “while”.</p>	(2)
5.	<p>(a) In the following code identify the local and global variables :</p> <pre> int x=9, y=4, z=3;char C='#'; void Row(int M, int N) { for(int J = 1; J<=N ; J++) cout <<M*J; cout<<endl; } void main() { Row(C, Y); Row(X, Z); } </pre>	(1)
	<p>(b) Observe the following program RANDNUM.CPP carefully. If the value of VAL entered by the user is 5, choose the correct possible output(s) from the options from (i) to (iv) and justify your option.</p> <pre> //program RANDNUM.CPP #include<iostream.h> #include<stdlib.h> #include<time.h> void main() { randomize(); int VAL, Rnd; int n=1; cin>> VAL; Rnd = 2 + random(VAL) ; while (n<=Rnd) { cout<<n<<'#'; n++; } } </pre> <p>(i) 0# 1# 2# 3# (ii) 1# 2# 3# (iii) 1# 2# 3# 4# (iv) 1#</p>	(2)

(c) Find the output of the following program :

(2+2)

(i)

```
void main()
{
    char poet[20]=; "ShakESpearE"
    for (int i=0;i<strlen(poet);i++)
    {
        if(islower(poet[i]))
            poet[i]=poet[i-1];
        else if(isupper(poet[i]))
            if(poet[i]= ='S')
                poet[i]='X'
    }
    cout<<poet; }
```

(ii)

```
#include <iostream.h>
#include <ctype.h>
void main()
{
    char Mystring[]="What@PUT!";
    for (int I=0 ;Mystring[I]!='\0';I++)
    {
        if(!isalpha(Mystring[I]))
            Mystring[I] = '*';
        else if(isupper(Mystring[I]))
            Mystring[I] = Mystring[I] + 1;
        else
            Mystring [I] = Mystring[I+1];
    }
    cout<<Mystring;
}
```

(d) Write a user defined function int dectobin (int dec) to convert a number from decimal to binary where dec is the decimal no.

(3)

6.	<p>(a) Write a program in C++ which accepts a string, counts the no. of words and print both the no. of words and the no. words beginning with 'A' or 'a'. (3)</p> <p>(b) Write the definition of a function Change(int P[], int N) in C++, which should change all the multiples of 10 in the array to 10 and rest of the elements to 1. For example, if an array of 10 integers is as follows : (3)</p> <table border="1" data-bbox="316 474 1360 590"> <tr> <td>P(0)</td><td>P[1]</td><td>P[2]</td><td>P[3]</td><td>P[4]</td><td>P[5]</td><td>P[6]</td><td>P[7]</td><td>P[8]</td><td>P[9]</td> </tr> <tr> <td>100</td><td>43</td><td>20</td><td>56</td><td>32</td><td>91</td><td>80</td><td>40</td><td>45</td><td>21</td> </tr> </table> <p>After executing the function, the array content should be changed as follows :</p> <table border="1" data-bbox="316 705 1360 821"> <tr> <td>P(0)</td><td>P[1]</td><td>P[2]</td><td>P[3]</td><td>P[4]</td><td>P[5]</td><td>P[6]</td><td>P[7]</td><td>P[8]</td><td>P[9]</td> </tr> <tr> <td>10</td><td>1</td><td>10</td><td>1</td><td>1</td><td>1</td><td>10</td><td>10</td><td>1</td><td>1</td> </tr> </table> <p>(c) Write a function in c++ which accepts a 2D array of integers, number of rows and number of columns as arguments and assign the elements which are divisible by 3 or 5 into a one dimensional array of integers. (4)</p> <p style="text-align: center;">If the 2D array is</p> <table border="1" data-bbox="683 989 1068 1199" style="margin-left: auto; margin-right: auto;"> <tr><td>12</td><td>3</td><td>9</td><td>14</td></tr> <tr><td>24</td><td>25</td><td>16</td><td>31</td></tr> <tr><td>19</td><td>32</td><td>45</td><td>27</td></tr> <tr><td>11</td><td>5</td><td>28</td><td>18</td></tr> </table> <p>The resultant 1D array is 12, 3, 9, 24, 25, 45, 27, 5, 18</p>	P(0)	P[1]	P[2]	P[3]	P[4]	P[5]	P[6]	P[7]	P[8]	P[9]	100	43	20	56	32	91	80	40	45	21	P(0)	P[1]	P[2]	P[3]	P[4]	P[5]	P[6]	P[7]	P[8]	P[9]	10	1	10	1	1	1	10	10	1	1	12	3	9	14	24	25	16	31	19	32	45	27	11	5	28	18	(3)
P(0)	P[1]	P[2]	P[3]	P[4]	P[5]	P[6]	P[7]	P[8]	P[9]																																																	
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19	32	45	27																																																							
11	5	28	18																																																							
7.	<p>(a) Find the output of the following program : (2)</p> <pre> #include<iostream.h> struct THREE_D { int X, Y,Z; } ; void MoveIn(THREE_D & T,int Step=1) { T.X+=Step; T.Y-=Step; T.Z+=Step; } void MoveOut(THREE_D & T,int Step=1) </pre>	(2)																																																								

```

{
T.X-=Step; T.Y+=Step;
T.Z-=Step;
}
void main()
{
THREE_D T1={10,20,5} T2={30,10,40};
MoveIn(T1);
MoveOut(T2,5);
cout<<T1.X<<" "<<T1.Y<<" "<<T1.Z<<endl;
cout<<T2.X<<" "<<T2.Y<<" "<<T2.Z<<endl;
}

```

(b) A structure employee is defined as follows :

```

Struct employee
{
int ID;
char name [20];
float basic;
}

```

Define a function int eligible_for_bonus (employee); to return 1 if basic < 15000, otherwise it should return a 0.

Invoke this function in a program to print a message whether employee is eligible for bonus or not. (1 = eligible; 0 = not eligible)

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