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Version No.			
8	1	2	1

ROLL NUMBER					

Answer Sheet No._____

Sign. of Candidate _____

Sign. of Invigilator _____

Section – A is compulsory. All parts of this section are to be answered on this page and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. Do not use lead pencil.

COMPUTER SCIENCE
HSSC–II
SECTION – A (Marks 15)
Time allowed: 20 Minutes

حصہ اوّل لازمی ہے۔ اس کے جوابات اسی صفحہ پر دے کر ناظم مرکز کے حوالے کریں۔ کاٹ کر دوبارہ لکھنے کی اجازت نہیں ہے۔ لیڈ پنسل کا استعمال ممنوع ہے۔

Fill the relevant bubble against each question:

ہر سوال کے سامنے دیے گئے درست دائرہ کو پُر کریں۔

1.	The && and || operators:	◯ Compare two numeric values	◯ Combine two numeric values	◯ Compare two Boolean values	◯ Combine two Boolean values
2.	In a class definition, data or functions designated private are accessible:	◯ To any function in the program	◯ Only if you know the password	◯ To member functions of that class	◯ Only to public members of the class
3.	If i, j are integer type and k is long type, k+j would represent which type of value:	◯ Integer	◯ Float	◯ Long	◯ Double
4.	In time sharing system, the term that refers to allocation of resources to program for limited amounts of time is called:	◯ Time slice	◯ Response time	◯ Time event	◯ Time allocation
5.	The getche() library function:	◯ Returns a character when any key is pressed	◯ Returns a character when Enter is pressed	◯ Displays a character on the screen when any key is pressed	◯ Does not display a character on the screen
6.	An array element is accessed using:	◯ A first-in-first-out approach	◯ The dot operator	◯ A member name	◯ An index number
7.	Which of the following state transition is NOT possible?	◯ Blocked to Running	◯ Ready to Running	◯ Blocked to Ready	◯ Running to Blocked
8.	In which SDLC stage the process of training personnel to use the new system is done?	◯ System Analysis	◯ System Design	◯ System Development	◯ System Implementation
9.	When the process is having all the resources except processor then it is considered in _____ state?	◯ Waiting	◯ Ready	◯ Running	◯ New
10.	Which SDLC stage is involved in the monitoring, evaluation, repairing and improving in an already developed system?	◯ Development	◯ Maintenance	◯ Analysis	◯ Testing

11.	The expression *test can be said to:	◯ Be a pointer to test	◯ Refer to the contents of test	◯ Dereference test	◯ Refer to the value of the variable pointed to by the test
12.	A pointer is:	◯ The address of a variable	◯ An indication of the variable to be accessed next	◯ A variable for storing addresses	◯ The data type of an address variable
13.	Who spend most of their time in the beginning stages of SDLC in talking with end-users, gathering information, documenting system and processing solutions?	◯ System Analyst	◯ Project Manager	◯ Top Manager	◯ System Designer
14.	A static local variable is used to:	◯ Make a variable visible to several functions	◯ Make a variable visible to only one function	◯ Conserve memory when a function is not executing	◯ Retain a value when a function is not executing
15.	The library function exit() causes an exit from:	◯ The loop in which it occurs	◯ The block in which it occurs	◯ The function in which it occurs	◯ The program in which it occurs

ROLL NUMBER					

COMPUTER SCIENCE HSSC–II

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Time allowed: 2:40 Hours **Total Marks Sections B and C: 60**

NOTE: Answer any twelve parts from Section 'B' and any three questions from Section 'C'. Use supplementary answer sheet i.e. Sheet–B if required. Write your answers neatly and legibly. Statistical table will be provided on demand.

SECTION – B (Marks 36)

Q. 2 Attempt any TWELVE parts. All parts carry equal marks. **(12 x 3 = 36)**

(i) Who is programmer? List any four responsibilities of the programmer.

(ii) Briefly describe how is the functionality of a system ensured?

(iii) What kind of program elements are the following?

a. 4

b. '4'

c. 4.2

d. class

e. cless()

f. "class"

(iv) Answer the following questions:

a. Write a statement that displays the variable FBISE in a field 10 characters wide.

b. Write a statement that gets a numerical value from the keyboard and places it in the variable temp.

c. What header file must be included in program to use setw()?

(v) What is process? And state different process states with their functions.

(vi) Write a do-while loop that displays the numbers from 100 to 10.

(vii) List key differences between process and thread.

(viii) Answer the following questions:

a. Write a statement that defines a one-dimensional array called **ABC** of type double that holds 100 elements.

b. Write a statement that takes element j of array **PQR** and writes it to cout<<

c. Write a statement that defines an array **BILLS** of type int and initializes it to the values of Pakistani currency notes (10,20,50,100,500,1000,5000).

(ix) Look at the following array definition.

int sales [8][10];

a. How many rows does the array have?

b. How many columns does the array have?

c. How many elements does the array have?

d. Write a statement that stores a number in the last column of the last row in the array.

e. Write a statement that stores a number in the 7^{th} column of the 3^{rd} row in the array.

f. Write a statement that replaces the value of the 7^{th} column of the last row in the array.

(x) Write declarations for two overloaded functions named FBISE(). The both have return type int. The first takes one argument of type char, and the second takes two arguments of type char. If this is impossible, justify why?

(xi) Answer the following questions:

a. What is the significance of empty parentheses in a function declaration?

b. What is the purpose of using argument names in a function declaration?

c. How many values can be returned from a function?

(xii) Write a code that uses a for loop to write the numbers 1 to10 to a file and reads all of the numbers from the file, and displays them.

(xiii) What is a pointer variable? Differentiate between reference operator (&) and dereference operator (*)?

(xiv) Answer the following questions:

a. Write statements that will create an object called XYZ of the ofstream class and associate it with the file called SALES.txt.

b. Write an if statement that checks whether an ifstream object called XYZ had reached the end of file.

c. Write a statement that writes a single character to an object called XYZ, which is of class ofstream.

(xv) Answer the following questions:

a. Write switch code that prints **Yes** if a variable ch is 'y', prints **No** if ch is 'n', and prints **Unknown response** otherwise.

b. Write a statement that uses a conditional operator to set **ticket** to 1 if **speed** is greater than 55, and to 0 otherwise.

c. Write an expression involving a logical operator that is true if **limit** is equal to 55 and **speed** is greater than 55.

(xvi) What three steps must be taken when a file is used by a program?

SECTION – C (Marks 24)

Note: Attempt any THREE questions. All questions carry equal marks. (3 x 8 = 24)

Q. 3 **a.** What is an array? Write its advantages. **(04)**

b. Write a program that lets the user enter 10 values into an array. The program should then display the largest and smallest values stored in the array. **(04)**

Q. 4 Create the equivalent of a four-function calculator. The program should ask the user to enter a number, an operator, and another number. It should then carry out the specified arithmetical operation: Adding, subtracting, multiplying, or dividing the two numbers. Use a **switch** statement to select the operation. Finally, display the result. When it finishes the calculation, the program should ask whether the user wants to do another calculation. The response can be 'y' or 'n'. Some sample interaction with the program might look like this: **(08)**

Example Output

Ener first number, operator, second number: 10/3
Answer = 3.333333
Do another (y/n)? y
Enter first number, operator, second number: 12+100
Answer = 112
Do another (y/n)? n

Q. 5 Raising a number n to a power p is the same as multiplying n by itself p times. Write a function called **power()** that takes a long int value for n and an int value for p, and returns the result as a long int value. Use a default argument of 2 for p, so that if this argument is omitted, the number n will be squared. Write a main() function that gets values from the user to test this function. **(08)**

Q. 6 **a.** Write a class declaration named **Circle** with a private member variable named **radius**. Write **set** and **get** functions to access the **radius** variable, Add a default constructor to the **Circle** the constructor should initialize the radius member to 0. Add on overloaded constructor to the Circle class the constructor should accept an argument and assign its value to the radius member variable. **(04)**

b. Describe the terms:

(i) Inheritance

(ii) Polymorphism

Each with an example from our daily life. **(04)**

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4	1	2	1

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Answer Sheet No._____

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COMPUTER SCIENCE
HSSC–II
SECTION – A (Marks 15)
Time allowed: 20 Minutes

حصہ اوّل لازمی ہے۔ اس کے جوابات اسی صفحہ پر دے کر ناظم مرکز کے حوالے کریں۔ کاٹ کر دوبارہ لکھنے کی اجازت نہیں ہے۔ لیڈ پنسل کا استعمال ممنوع ہے۔

Fill the relevant bubble against each question:

ہر سوال کے سامنے دیے گئے درست دائرہ کو پُر کریں۔

1. The && and || operators:
   - ◯ Compare two numeric values
   - ◯ Combine two numeric values
   - ◯ Compare two Boolean values
   - ◯ Combine two Boolean values

2. Which concept allows you to reuse the written code in C++?
   - ◯ Inheritance
   - ◯ Polymorphism
   - ◯ Abstraction
   - ◯ Encapsulation

3. Pick the incorrect statement about inline functions in C++?
   - ◯ Saves overhead of a return call from a function
   - ◯ They are generally very large and complicated functions
   - ◯ These functions are inserted/substituted at the point of call
   - ◯ They reduce function call overheads

4. What will be the output of the following C++ code?

```
#include<iostream.h>
using namespace std;
int main ()
{
   int a = 5
   int b = 4;
            cout<<sizeof(a);
            cout<<a+b;
            return 0;
}
```

   - ◯ 46
   - ◯ 47
   - ◯ 48
   - ◯ 49

5. If i, j are integer type and k is long type, k+j would represent which type of value:
   - ◯ Integer
   - ◯ Float
   - ◯ Long
   - ◯ Double

6. Which of the following **correctly** declares an array in C++?
   - ◯ array {10};
   - ◯ array array [10];
   - ◯ int array;
   - ◯ int array[10];

7. Which operating system allows execution of application software on different computers in a network?
   - ◯ Parallel processing operating system
   - ◯ Multi-tasking operating system
   - ◯ Distributed operating system
   - ◯ Multi-processor operating system

8. Which method of implementing from an old system to a new system involves a gradual introduction of the new system?
   - ◯ Step-by-step implementation
   - ◯ Phased implementation
   - ◯ Parallel implementation
   - ◯ Pilot implementation

9.	Which of the following creates user groups and assigns privileges to them?	◯ Process management	◯ I/O management	◯ File management	◯ Network management
10.	Which is **correct** syntax?	◯ f:open("x.txt",ios::out);	◯ f.open("x.txt",ios::out);	◯ f::open("x.txt",ios::out);	◯ f.open("x.txt",io s:out);
11.	The expression *test can be said to:	◯ Be a pointer to test	◯ Refer to the contents of test	◯ Dereference test	◯ Refer to the value of the variable pointed to by the test

12.	What will happen in the following C++ code?
	int a = 100, b=200;
	int*p=&a,*q=&b;
	p=q;
		◯ b is assigned to a	◯ p now points to b	◯ a is assigned to b	◯ q now points to a

13.	What should be done to correct the following 'for loop' statement? for (int k=2, k<=12, k++)	◯ The increment should always be ++k	◯ The variable must always be the letter i when using a for loop	◯ There should be a semicolon at the end of the statement	◯ The commas should be semicolons
14.	A static local variable is used to:	◯ Make a variable visible to several functions	◯ Make a variable visible to only one function	◯ Conserve memory when a function is not executing	◯ Retain a value when a function is not executing
15.	Which of the following returns **FALSE** if X=2 and Y=3?	◯ if(X==Y)||(Y>X)	◯ If(X==2)&&(Y>2)	◯ If(X<Y)&&(X>2)	◯ if(!(Y>3))

ROLL NUMBER					

COMPUTER SCIENCE HSSC–II

36

Time allowed: 2:40 Hours **Total Marks Sections B and C: 60**

NOTE: **Answer any twelve parts from Section 'B' and any three questions from Section 'C'. Use supplementary answer sheet i.e. Sheet–B if required. Write your answers neatly and legibly. Statistical table will be provided on demand.**

SECTION – B (Marks 36)

Q. 2 Attempt any TWELVE parts. All parts carry equal marks. **(12 x 3 = 36)**

(i) Differentiate between Multiprogramming and time-sharing operating system.

(ii) Write a C++ code to copy the contents of ABC.txt to XYZ.txt.

(iii) What is a constructor? Also write the rules/features for naming constructor.

(iv) What is access specifier? Also enlist different types of access specifier used in a class.

(v) What is the purpose of requirement engineering? Differentiate between the types of requirements gathering.

(vi) What is Ternary operator? Write its generalized syntax with an example.

(vii) What will be the output of the following program?

```
void main () {
int a = 15, b;
b = a%9;          a = ++a-a(--b);
cout<<"a="<<a<<"b<<b<<endl;
cout<<"a now ="<<a++<<"b="<<b++<<endl;
cout<<"value of a="<<++a<<"value of b="<<b<<endl;  }
```

(viii) Write the purpose and example of following escape sequence: \r, \b, \a.

(ix) Write an expression to test each of the following relationships: (any three)

a. **age** is from 18 to 25

b. **temperature** is less than 40.0 and greater than 25.0

c. **year** is divisible by 4 (Hint: use%)

d. **speed** is not greater than 80

e. **y** is greater than x and less than z

f. **w** is either equal to 6 or not greater than 3

(x) Write a C++ code that:

a. insert strings of S1 and S2 in S3 by strcat() function and displays S3

b. displays the comparison result of S1 and S2

c. displays the lengths of S3

(xi) Write a code to find the sum of all elements in a matrix of 4x4 in C++.

(xii) What is an Array? Write syntax of the declaration and initialization of two-dimensional array with example.

(xiii) Briefly describe the features of function overloading.

(xiv) A program uses a function named **convert()** in addition to its main function. The function **main()** declares the variable **x** within its body and the function **convert()** declares two variables **y** and **z** within its body, **z** is made **static**. A fourth variable **m** is declared ahead (i.e. at top) of both the functions. State the visibility and lifetime of each of these variables.

(xv) What are the benefits of arrays? Differentiate between one and two-dimensional arrays.

(xvi) What is a pointer variable? Differentiate between reference operator (&) and dereference operator (*).

SECTION – C (Marks 24)

Note: **Attempt any THREE questions. All questions carry equal marks.** **(3 x 8 = 24)**

Q. 3 **a.** Describe any three of the five states of a process with labeled diagram. **(04)**

b. Differentiate between following deployment methods: (2-pionts each) **(04)**

(i) Direct vs Parallel

(ii) Phased vs Pilot

Q. 4 Write a program: **(08)**

That takes a number from user and finds whether this number is prime or otherwise
If it is prime it takes value of its exponent from user and prints its power
If not prime then prints the factorial of the given number

Q. 5 Write a C++ program to overload area() function to calculate area of shapes like triangle, square, circle, rectangle and test it by taking values from user. **(08)**

*Hint

(i) area of a circle is $A = \pi r^2$

(ii) area of a triangle $A = \frac{1}{2}bh$

(iii) area of square = side^2

(iv) area of rectangle = length*breath

Q. 6 **a.** Describe the terms:

(i) Inheritance

(ii) Polymorphism

Each with an example from our daily life. **(04)**

b. Explain the steps involved in reading and writing to a file in C++ program. **(04)**