## HIGHER SECONDARY SECOND YEAR

## PUBLIC EXAMINATION – MARCH 2024

## COMPUTER SCIENCE   ANSWERS KEY

### PART-I

**Answer All the Questions**                         **15 x 1=15**

| Q. NO | OPTION | ANSWER | Mark |
|---|---|---|---|
| 1 | c | Big O | 1 |
| 2 | c | Abstract datatype | 1 |
| 3 | b | F5 | 1 |
| 4 | a | Interface | 1 |
| 5 | a | Access control | 1 |
| 6 | d | [ ] | 1 |
| 7 | c | Instantiation | 1 |
| 8 | d | x%4==0 | 1 |
| 9 | b | σ | 1 |
| 10 | a | [10,20,35,40,50] | 1 |
| 11 | b | Flat file | 1 |
| 12 | d | select | 1 |
| 13 | a | 0 1 3 4 | 1 |
| 14 | d | Dashboard | 1 |
| 15 | d | ORDER BY | 1 |

### PART-II

**Answer any six questions. Question no 24 is compulsory**          **6x2=12**

| Q. NO | ANSWER | MARKS |
|---|---|---|
| **16.** | Abstract Data type (ADT) is a type for objects whose behavior is defined by a set of values and operations. | **2** |
| **17.** | ➤ Arithmetic operators<br>➤ Relational operators  (OR) Comparative operators<br>➤ Logical operators | **2** |

| | | |
|---|---|---|
| | ➢ Assignment operators<br>➢ Conditional operator | |
| **18.** | To search an item in data structure is called as searching<br>(or)<br>Searching is used to locate specific data in a list<br>Types 1.Linear Search (or)Sequential Search<br>      2.Binary Search (or) half-interval Search | **1**<br><br><br>**1** |
| **19.** | 1.User-defined Functions<br>2.  Built-in Functions<br><br>3.Lambda Functions<br><br>4.Recursion Functions | **2** |
| **20.** | ➢  Line plot<br>➢  Scatter plot<br>➢  Histogram<br>➢  Box plot<br>➢  Bar chart<br>➢  Pie chart        [Any four] | **2** |
| **21.** | <table><tr><td>Hierarchical Model</td><td>Network Model</td></tr><tr><td>In Hierarchical Model, a child record has only one parent node.</td><td>In a Network model, a child may have many parent nodes</td></tr><tr><td>In Hierarchical model, data is represented as a simple tree like structure form. This model represents a one-to-many relationship</td><td>It represents the data in many-to-many relationships</td></tr></table> | **2** |
| **22.** | A CSV file is a human readable text file where each line has a number of fields, separated by commas or some other delimiter. | **2** |
| **23.** | The fetch all() method is used to fetch all rows from the database table | **2** |
| **24.** | pop () function can also be used to delete an element using the given index value.<br>(OR)<br>pop() function deletes and returns the last element of a list if the index is not given. | **2** |

## PART-III

**Answer any six questions. Question no 33 is compulsory          6x3=18**

| | ANSWER | MARKS |
|---|---|---|
| **25.** | | |

| Pure function | Impure function | |
|---|---|---|
| The return value of the pure functions not solely depends on its arguments passed | The return value of the impure functions does not solely depends on its arguments passed | **1** |
| They do not have any side effects | They have any side effects | **1** |
| They do not modify the arguments which are passed to them | They may modify the arguments which are passed to them | **1** |

| **26.** | The elements of a list can be accessed in two ways<br>(**i**) **multiple assignment,** which unpacks a list into its elements and binds each element to a different name<br>lst := [10, 20]<br><br>x, y := lst<br>will become10 and *y* will become 20.<br>(**ii**) **element selection operator.**a square-brackets expression directly following another expression does not evaluate to a list value, but instead selects an element from the value of the preceding expression.<br>lst[0]<br>10<br>lst[1]<br>20 | **1 ½**<br><br><br><br><br><br>**1 ½** |
|---|---|---|
| **27.** | Asymptotic Notations are languages that uses meaningful statements about time and space complexity<br>(i) Big O<br><br>(ii) Big Ω<br><br>(iii) Big Θ | **2**<br><br><br><br>**1** |
| **28.** | a=int(input("Enter the number1:"))<br>b=int(input("Enter the number2:"))<br>c=int(input("Enter the number3:"))<br>if a>b and a>c:<br>    print("a is greater")<br>elif b>a and b>c:<br>    print("b is greater")<br>else:<br>    print("c is greater") | **3** |

| 29. | (a) capitalize( ) - Used to capitalize the first character of the string<br>(b)swapcase( )- It will change case of every character to its opposite case vice-versa<br>**Any Suitable Example…..** | **2**<br><br><br>**1** |
|---|---|---|
| 30. | **Constructor**<br>Constructor is the special function that is automatically executed when an object of a class is created.<br> In Python, there is a special function called **"init"** which act as a Constructor. It must begin and end with double underscore.<br>**Destructor**<br>Destructor is also a special method to destroy the objects.<br>In Python, _ _del_ _( ) method is used as destructor.<br> It is just opposite to constructor | **1 ½**<br><br><br><br><br><br>**1 ½** |
| 31 | 1. To automate certain tasks in a program<br><br>2. Extracting information from a data set<br><br>3. Less code intensive as compared to traditional programming language<br><br>4. can bring new functions to applications and glue complex systems together                    [Any Three] | **3** |
| 32. | WHERE clause is used to extract only those records that fulfill a specified condition.<br>**Any Suitable Example…..** | **1**<br><br>**2** |
| 33. | **Commit:** Saves any transaction into the database permanently<br><br>**Roll back:** Restores the database to last commit state.<br><br>**Save point:** Temporarily save a transaction so that you can rollback | **1**<br><br>**1**<br><br>**1** |

## PART-IV

**Answer all questions.**                                              **5x5=25**

| 34. a) | To facilitate data abstraction, you will need to create two types of functions: constructors and selectors.<br>Constructors are functions that build the abstract data type.<br>Selectors are functions that retrieve information from the data type.<br>**Ex:** This city object will hold the city's name, and its latitude and longitude. To create a city object, you'd use a function like city:= makecity (name, lat, lon)<br>To extract the information of a city object, you would use functions like<br><br>getname(city) | **2**<br><br><br><br><br>**3** |
|---|---|---|

| | | |
|---|---|---|
| | getlat(city)<br><br>getlon(city) | |
| b) |      Binary search also called half-interval search algorithm. It finds the position of a search element within a sorted array.<br>    Pseudo Code<br>   • Start with the middle element<br>   • If the search element is equal to the middle element of the array, then return the index of the middle element.<br>   • If not, then compare the middle element with the search key<br>   • If the search element is greater than the number in the middle index, then select the elements to the right side of the middle index, and go to Step-1.<br>   • If the search element is less than the number in the middle index, then select the elements to the left side of the middle index, and start with Step-1.<br>   • When a match is found, display success message with the index of the element matched<br>   • If no match is found for all comparisons, then display unsuccessful message<br>**A Suitable Example** | **1**<br><br><br><br><br>**2**<br><br><br><br><br><br><br><br><br><br>**2** |
| 35.a) | **Print( ) function**<br>In Python, the **print()** function is used to display result on the screen<br> **Syntax:**<br>print ("string to be displayed as output " )<br>print (variable )<br>print ("String to be displayed as output ", variable)<br>print ("String1 ", variable, "String 2", variable, "String 3" ……)<br>(Any one of syntax)<br>**Any Suitable Example**<br>**input( ) function**<br>In Python, input( ) function is used to accept data as input at run time. The syntax for input() function is,<br>**Syntax:**<br>Variable = input ("prompt string")<br>**Any Suitable Example** | **2 ½**<br><br><br><br><br><br><br><br><br><br>**2 ½** |
| b) | Scope of variable refers to the part of the program, where it is accessible.There are two types of scopes:Local Scope and Global Scope<br>**Local Scope-** A variable declared inside the function's body is known as local variable. It can be accessed only within the function that it is created in | **1**<br><br><br>**1**<br><br><br>**1** |

| | | |
|---|---|---|
| | **Any Suitable Example** | |
| | **Global Scope** -A variable, with global scope can be used anywhere in the program. It can be created by defining a variable outside the scope of any function/block.The 'global' keyword is used to access a variable inside a function | **1** |
| | **Any Suitable Example** | **1** |
| 36.a) | **(3 marks can be allotted if anyone of the method is written)**<br><br>The range() is a function used to generate a series of values in Python.<br><br>Using range() function, you can create list with series of values.<br><br>The range() function has three arguments.<br><br> **Syntax of range ( ) function:**<br><br>*range (start value, end value, step value)*<br><br>**start value** – beginning value of series. Zero is the default beginning value.<br><br>**end value** – upper limit of series. Python takes the ending value as upper limit – 1.<br><br>**step value** – It is an optional argument, which is used to generate different interval of values.<br><br><div align="center">**(OR)**</div><br>The range() is a built-in function, to generate series of values between two numeric intervals.<br><br>**The syntax of range() is as follows:**<br><br>**range (start,stop,[step])**<br><br>Where,<br>start – refers to the initial value<br>stop – refers to the final value<br>    step – refers to increment value, this is optional part.<br><br>**Any valid  example** | **3**<br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br>**2** |

| | | |
|---|---|---|
| b) | (i) **UNION (Symbol :∪)**<br><br>It includes all tuples that are in tables A or in B. It also eliminates duplicates. Set A Union Set B would be expressed as A ∪ B<br>**Suitable examples**<br><br>(ii) **INTERSECTION (symbol : ∩) A ∩ B**<br><br>Defines a relation consisting of a set of all tuple that are in both in A and B. However, A and B must be union-compatible.<br>**Suitable examples**<br><br>**(iii)SET DIFFERENCE ( Symbol : - )**<br><br>The result of A − B, is a relation which includes all tuples that are in A but not in B.<br><br>The attribute name of A has to match with the attribute name in B.<br>**Suitable examples**<br><br>**(iv)CARTESIAN PRODUCT (Symbol : X )**<br><br>Cross product is a way of combining two relations. The resulting relation contains, both relations being combined.<br>**Suitable examples** | **1**<br><br><br>**1**<br><br><br>**1**<br><br><br><br>**1**<br><br><br>**1** |
| 37.a) | SQL commands are divided into five categories:<br><br>DML - Data Manipulation Language<br><br>DDL - Data Definition Language<br><br>DCL - Data Control Language<br><br>TCL - Transaction Control Language<br><br>DQL - Data Query Language<br><br>**Explanation** | **1**<br><br><br><br><br><br><br><br>**4** |
| b. | • Python uses Automatic Garbage Collection whereas C++ does not.<br>• C++ is a statically typed language, while Python is a dynamically typed language.<br>• Python runs through an interpreter, while C++ is pre-compiled.<br>• Python code tends to be 5 to 10 times shorter than that written in C++.<br>• In Python, there is no need to declare types explicitly | **5** |

|       |                                                                                                                                                                                                                                                                                                                   |   |
|-------|---|---|
|       | where as it should be done in C++<br>• In Python, a function may accept an argument of any type, and return multiple values without any kind of declaration beforehand. Whereas in C++ return statement can return only one value.<br>**(Any Five)** |   |
| 38.a) | There are two ways to read a CSV file.<br><br>1. Use the csv module's reader function<br><br>2. Use the DictReader class<br><br>When you want to read from or write to a file,you need to open it. Once the reading is over it needs to be closed.<br><br>**csv.reader() function.**<br><br>You can read the contents of CSV file with the help of csv.reader() function. The reader function is designed to take each line of the file and make a list of all columns<br><br>The syntax for csv.reader() is<br><br>csv.reader(fileobject,delimiter,fmtparams)<br><br>**DictReader method**<br><br>It creates an object which maps data to a dictionary. The keys are given by the fieldnames as parameter. DictReader works by reading the first line of the CSV and using each comma separated value in this line as a dictionary key. The columns in each subsequent row then behave like dictionary values and can be accessed with the appropriate key | **1**<br><br>**2**<br><br><br><br>**2** |
| b.    | **Home Button** → The Home Button will help once you have begun navigating your chart. If you ever want to return back to the original view, you can click on this.<br><br>**Forward/Back buttons** → These buttons can be used like the Forward and Back buttons in your browser. You can click these to move back to the previous point you were at, or forward again.<br><br>**Pan Axis** → This cross-looking button allows you to click it, and then click and drag your graph around.<br><br>**Zoom** → The Zoom button lets you click on it, then click and drag a square that you would like to zoom into specifically. Zooming in will require a left click and drag. You can alternatively zoom out with a right click and drag.<br><br>**Configure Subplots** → This button allows you to configure various spacing options with your figure and plot.<br><br> **Save Figure** → This button will allow you to save your figure in various forms<br>**(Any Five)** | **5** |

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