

**HSE SECOND YEAR EXAMINATIONS, MARCH - 2024**

**COMPUTER SCIENCE - ANSWER KEY**

**Instructions :**

1. Only answers written in Blue Or Black ink should be evaluated
2. Choose the most appropriate answer the given four alternatives and write the option code and the corresponding answer.
3. If any of the answer option code or answer is incorrect then only zero marks shall be awarded.

**Maximum Marks = 70**

**PART - I**

**Answer all the questions.**

**15×1=15**

Qn. no.	Option code	Answer	Marks
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)	$\sigma$	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

Answer any six questions. Question No.24 is compulsory.

6×2=12

Qn. No.	Answer	Marks								
16	Abstract Data Type (ADT) is a type for object whose behavior is defined by a set of values and operations.	2								
17	<ol style="list-style-type: none"> <li>1. Arithmetic operator,</li> <li>2. Relational operator or comparative operator,</li> <li>3. Logical operator,</li> <li>4. Assignment operator and</li> <li>5. Conditional operator or Ternary operator</li> </ol> <p style="text-align: right;"><b>Any 4 Only</b></p>	2								
18	<p>To search an item in a data structure is known as searching (or)</p> <p>Searching is the step - by - step procedure used to locate specific data among collections of data using any searching algorithm.</p> <p>Types :</p> <ol style="list-style-type: none"> <li>1. Linear search</li> <li>2. Binary search</li> </ol>	2								
19	<ol style="list-style-type: none"> <li>1. User-defined functions</li> <li>2. Built-in functions</li> <li>3. Lambda functions and</li> <li>4. Recursion functions</li> </ol>	2								
20	<ul style="list-style-type: none"> <li>• Line Plot</li> <li>• Scatter Plot</li> <li>• Histogram</li> <li>• Box Plot</li> <li>• Bar chart</li> <li>• Pie chart</li> </ul>	2								
21	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Hierarchical model</th> <th style="width: 50%;">Network Model</th> </tr> </thead> <tbody> <tr> <td>1. Child record has only one parent.</td> <td>1. Child record may have many parent nodes.</td> </tr> <tr> <td>2. It represents one -to-many relationships</td> <td>2. It represents many-to-many relationships</td> </tr> <tr> <td>3. Difficult to access data.</td> <td>3. Easy to access data</td> </tr> </tbody> </table> <p style="text-align: right;"><b>Any 2 Only</b></p>	Hierarchical model	Network Model	1. Child record has only one parent.	1. Child record may have many parent nodes.	2. It represents one -to-many relationships	2. It represents many-to-many relationships	3. Difficult to access data.	3. Easy to access data	2
Hierarchical model	Network Model									
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3. Difficult to access data.	3. Easy to access data									
22	A CSV file is human readable text file where each line has a number of fields, separated by commas or some other delimiter.	2								
23	The <b>fetchall ()</b> method is used to fetch all rows from the database table.	2								

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Qn. No.	www.Padasalai.Net Answer	www.Trb Tnpsc.com	Marks
24	<ul style="list-style-type: none"> <li>• pop() function is used to delete a particular element from a list using its index value.</li> <li>• pop() function is used to delete only one element from a list</li> <li>• As soon as the element is deleted, this function shows the element which is deleted</li> </ul>		2
<b>Any 1 Only</b>			

PART -III

Answer any six questions. **Question no.33** is compulsory.

6 X 3 = 18

Qn. No.	Answer	Marks										
25	<table border="1" style="width: 100%;"> <thead> <tr> <th>Pure Function</th> <th>Impure Function</th> </tr> </thead> <tbody> <tr> <td>The return value of the pure functions solely depends on its arguments passed.</td> <td>The return value of the impure functions does not solely depend on its arguments passed.</td> </tr> <tr> <td>Hence, if you call the pure functions with the same set of arguments, you will always get the same return values.</td> <td>Hence, if you call the impure functions with the same set of arguments, you might get the different return values.</td> </tr> <tr> <td>They do not have any side effects.</td> <td>They have side effects.</td> </tr> <tr> <td>They do not modify the arguments which are passed to them.</td> <td>They may modify the arguments which are passed to them.</td> </tr> </tbody> </table>	Pure Function	Impure Function	The return value of the pure functions solely depends on its arguments passed.	The return value of the impure functions does not solely depend on its arguments passed.	Hence, if you call the pure functions with the same set of arguments, you will always get the same return values.	Hence, if you call the impure functions with the same set of arguments, you might get the different return values.	They do not have any side effects.	They have side effects.	They do not modify the arguments which are passed to them.	They may modify the arguments which are passed to them.	3
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<b>Any 3 Only</b>												
26	<p>The elements of a list can be accessed in two ways.</p> <p><b>1. Multiple assignment:</b> This method which unpacks a list into its elements and binds each element to a different name. Ex: lst := [10, 20]     x, y := lst x will become 10 and y will become 20.</p> <p><b>2. Element Selection Operator:</b> It is expressed using square brackets. Access the elements in a list is by element selection operator. <b>Example:</b> lst [0]                   10</p>	3										
<b>Any relevant example</b>												

Qn. No.	<a href="http://www.Padasalai.Net">www.Padasalai.Net</a> Answer <span style="float: right;"><a href="http://www.Trb Tnpsc.com">www.Trb Tnpsc.com</a></span>	Marks
27	<p><b>Asymptotic Notations</b> are languages that use meaningful statements about time and space complexity.</p> <p><b>Big O</b> - Worst-case of an algorithm.</p> <p><b>Big <math>\Omega</math></b> - Best -case of an algorithm</p> <p><b>Big <math>\Theta</math></b> - complexity case of an algorithm <b>(Or)</b></p> <p style="text-align: center;">lower bound = upper bound</p>	<p style="text-align: center;">1</p> <p style="text-align: center;">2</p>
28	<p><b>Program:</b></p> <pre>a=int(input("Enter the first number:")) b=int(input("Enter the second number:")) c=int(input("Enter the third number:")) if (a&gt;b) and (a&gt;c):     print(a, " is the largest number") elif (b&gt;c):     print(b, " is the largest number ") else:     print(c, " is the largest number ")</pre> <p><b>(Or any suitable program)</b></p>	<p style="text-align: center;">3</p>
29	<p><b>(a) capitalize():</b> Used to capitalize the first character of a string</p> <p><b>Example:</b></p> <pre>&gt;&gt;&gt; city="tamilnadu" &gt;&gt;&gt; print(city.capitalize()) Tamilnadu</pre> <p style="text-align: center;"><b>(Or)</b></p> <p><b>(Any one suitable example)</b></p> <p><b>(b) swapcase():</b> It will change case of every character to its opposite case vice-versa.</p> <p><b>Example:</b></p> <pre>&gt;&gt;&gt;str1="tamil NADU" &gt;&gt;&gt; print(str1.swapcase())</pre>	<p style="text-align: center;">3</p>
30	<p><b>Constructor :</b> Constructor is a special function that is automatically executed when an object of a class is created. <code>__init__()</code> method is used as constructor</p> <p style="text-align: center;"><b>(Or)</b></p> <pre>def __init__(self, [args .....]):     &lt;statements&gt;</pre> <p><b>Destructor:</b> Destructor is also a special method to destroy the objects. <code>__del__()</code> method is used as destructor.</p> <p style="text-align: center;"><b>(Or)</b></p> <pre>def __del__(self):     &lt;statements&gt;</pre>	<p style="text-align: center;">3</p>

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Qn. No.	www.Padasalai.Net Answer	www.Trb Tnpsc.com	Marks
31	1. To automate certain tasks in a program. 2. Extracting information from a data set. 3. Less code intensive as compared to traditional programming language. 4. Can bring new functions to applications and glue complex systems together <b>(Any three points)</b>		3
32	The WHERE clause is used to extract only those records that fulfil a specified condition. <b>Example:</b> cursor.execute("SELECT DISTINCT (Grade) FROM student where gender='M'") <b>(Or any suitable example)</b>		3
33	<b>Commit :</b> Saves any transaction into the database permanently.  <b>Roll back :</b> Restores the database to last commit state.  <b>Save point :</b> Temporarily save a transaction so that you can rollback.		3

#### PART - IV

Answer all questions

5 X 5 = 25

Qn. No.	Answer	Marks
34	To facilitate data abstraction, you will need to create constructors and selectors. ➤ Constructors are functions that build the abstract data type. ➤ Selectors are functions that retrieve information from the data type. <b>For example</b> Let's take an abstract datatype called city. This city object will hold the city's name, and its latitude and longitude. <b>city := makecity (name, lat, lon)</b> ✓ Here the function makecity (name, lat, lon) is the constructor. When it creates an object city, the values name, lat and lon are sent as parameters. ✓ <b>getname(city), getlat(city) and getlon(city)</b> are selector functions that obtain information from the object city.	2
		3

(OR)

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Qn. No.	Answer	Marks
34 (b)	❖ Binary search is also called half-interval search algorithm. ❖ It finds the position of a search element within a sorted array. <b>Any suitable example</b>  <b>Explain with a suitable example</b>	2   3
35 (a)	<b>(i) input() function:</b> In Python, input( ) function is used to accept data as input at run time. <b>The syntax:</b> Variable = input ("prompt string") <b>Suitable Example</b> <b>(ii) print() function:</b> In Python, the print() function is used to display result on the screen. <b>The syntax:</b> print ("String") print (variable ) print ("String", variable) print ("String1", variable, "String2", variable, "String3" ...) <b>(Any one syntax)</b>  <b>Suitable Example</b>	5
(OR)		
35 (b)	1. Local scope 2. Global scope 3. Enclosed scope 4. Built-in Scope  Explain each with suitable example (or) <b>Local Scope (Rules and Relevant Example)</b> <b>Global Scope (Rules and Relevant Example)</b>	5
36 a)	<ul style="list-style-type: none"> <li>• <b>Range()</b> is the function used to generate a series of values in python</li> <li>• Using <b>range()</b> function ,we can create list with series of values .</li> <li>• The <b>range()</b> function has three arguments</li> </ul> <b>Syntax:</b> <b>range( start , stop , [step])</b>  <b>Suitable example with explanation</b>	5
(OR)		

Qn. No.	Answer	Marks
36 (b)	<p><u><b>Relational Algebra:</b></u></p> <p>(i) Union(Symbol: <math>\cup</math>)            (ii) Intersection(Symbol: <math>\cap</math>)            (iii) Difference(Symbol: <math>-</math>)            (iv) Cartesian Product(Symbol: <math>\times</math>)</p> <p style="text-align: center;"><b>Explanation with one suitable example</b></p>	5
37 (a)	<p><b>Components of SQL:</b></p> <ul style="list-style-type: none"> <li>• DML - DATA MANIPULATION LANGUAGE</li> <li>• DDL - DATA DEFINITION LANGUAGE</li> <li>• DCL - DATA CONTROL LANGUAGE</li> <li>• TCL - TRANSACTION CONTROL LANGUAGE</li> <li>• DQL - DATA QUERY LANGUAGE</li> </ul> <p>DDL-CREATE,ALTER,DROP,TRUNCATE            DML-INSERT,UPDATE,DELETE,            DCL-GRANT,REVOKE            TCL-COMMIT,ROLL BACK ,SAVE POINT            DQL-SELECT</p> <p style="text-align: right;"><b>(Explain)</b></p>	2       3
<b>(OR)</b>		
37 (b)	<p><b>Features of Python over C++</b></p> <ul style="list-style-type: none"> <li>• Python uses Automatic Garbage Collection whereas C++ does not.</li> <li>• C++ is a statically typed language, while Python is a dynamically typed language.</li> <li>• Python runs through an interpreter, while C++ is pre-compiled.</li> <li>• Python code tends to be 5 to 10 times shorter than that written in C++. In Python, there is no need to declare types explicitly where as it should be done in C++</li> <li>• 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.</li> </ul> <p style="text-align: right;"><b>(Write any 5)</b></p>	5

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Qn. No.	Answer	Marks
38 (a)	<p>There are two ways to read a CSV file.</p> <ol style="list-style-type: none"> <li>1. Use the csv module's reader function</li> <li>2. Use the DictReader class.</li> </ol> <p><b>1. CSV Module's Reader Function:</b></p> <ul style="list-style-type: none"> <li>➤ The csv.reader() method is designed to take each line of the file and make a list of all columns.</li> <li>➤ Using this method one can read data from csv files of different formats like quotes (" "), pipe ( ) and comma (,).</li> </ul> <p><b>The syntax for csv.reader() is</b>  code&gt;csv.reader(fileobject, delimiter, fmtparams)</p> <p style="text-align: right;"><b>Any Suitable Example</b></p> <p><b>2. Reading CSV File Into A Dictionary:</b></p> <ul style="list-style-type: none"> <li>➤ To read a CSV file into a dictionary can be done by using DictReader which creates an object which maps data to a dictionary.</li> <li>➤ DictReader works by reading the first line of the CSV and using each comma separated value in this line as a dictionary key.</li> <li>➤ The columns in each subsequent row then behave like dictionary values and can be accessed with the appropriate key.</li> </ul> <p style="text-align: right;"><b>Any Suitable Example</b></p>	5
(OR)		
38 (b)	<ul style="list-style-type: none"> <li>▪ <b>Home Button</b> → If you ever want to return back to the original view, you can click on this.</li> <li>▪ <b>Forward/Back buttons</b> → These buttons can be used like the Forward and Back buttons in your browser.</li> <li>▪ <b>Pan Axis</b> → To click it, and then click and drag your graph around.</li> <li>▪ <b>Zoom</b> → 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.</li> <li>▪ <b>Configure Subplots</b> → This button allows you to configure various spacing options with your figure and plot.</li> <li>▪ <b>Save Figure</b> → This button will allow you to save your figure in various forms.</li> </ul> <p><b>(Any five buttons. No need to draw the buttons/icons)</b></p>	5