INDIAN SCHOOL AL WADI AL KABIR

ARTIFICIAL INTELLIGENCE (SUBJECT CODE - 417)

Sample Question Paper for Class IX

Max. Time: 2 Hours   **Max. Marks: 50**

UNIT NO.	UNIT NAME	OBJECTIVE TYPE QUESTIONS 1 MARK EACH	SHORT ANSWER TYPE QUESTIONS 2 MARK EACH	DESCRIPTIVE/ LONG ANS. TYPE QUESTIONS 4 MARKS EACH	TOTAL QUESTIONS
1	INTRODUCTION TO AI	5	2	1	8
2	AI PROJECT CYCLE	6	2	1	9
3	NEURAL NETWORK	5	2	1	8
4	INTRODUCTION TO PYTHON	8	3	2	13
	TOTAL QUESTIONS	24	9	5	38
	NO. OF QUESTIONS TO BE ANSWERED	24	7	3	34
	TOTAL MARKS	24	14	12	50

General Instructions:

1. Please read the instructions carefully.

2. This Question Paper consists of **38 questions** in two sections: Section A & Section B.

3. Section A has Objective type questions whereas Section B contains Subjective type questions.

4. **Out of the given 38 questions, a candidate has to answer 34 questions in the allotted (maximum) time of 2 hours.**

5. All questions of a particular section must be attempted in the correct order.

SECTION A - OBJECTIVE TYPE QUESTIONS (24 MARKS):

1. Marks allotted are mentioned against each question/part.
2. There is no negative marking.
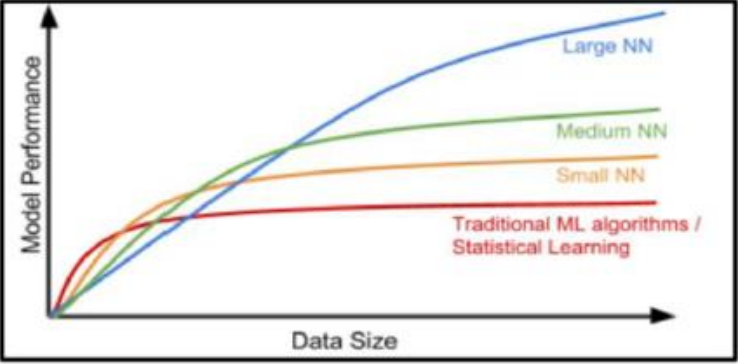3. Do as per the instructions given.

SECTION B – SUBJECTIVE TYPE QUESTIONS (26 MARKS):

1. This section has 14 questions.
2. A candidate has to do 10 questions.
3. Do as per the instructions given.
4. Marks allotted are mentioned against each question/part.

SECTION A: OBJECTIVE TYPE QUESTIONS

No.	Answer all questions	Mark
1.	Statement1: AI is getting integrated into our lives seamlessly. Statement2: Often we do not even realize that we are using AI. a) Statement 2 is correct and Statement 1 is incorrect. b) Statement 1 is correct and Statement 2 is incorrect c) Both Statement1 and Statement2 are correct1 d) Both Statement1 and Statement2 are incorrect	1
2.	An application lets you search what you see, get things done faster and understand the world around you – using just your camera or a photo. Which domain does this app belong to? a) Natural Language Processing b) Data Sciences c) Computer Vision d) Artificial Language Processing	1
3.	Fill in the blanks with the correct answers given below: The _____Sustainable Development Goals (SDGs) were launched at the United Nations Sustainable Development Summit in New York in the year _____, forming the _____ Agenda for Sustainable Development. a) 17 , 2015 , 2030 b) 15 , 2010 , 2025 c) 17, 2010 , 2025 d) 15 , 2010 , 2030	1
4.	When you search for 'Doctor' on a search website, the results for Doctor images might mostly come up as 'male'. Whereas for 'Nurse' most results would be 'female'. What does this depict? a) Gender bias b) Data Privacy c) Poor training d) Lack of access	1
5.	A _____ is a flexible house setup in which appliances and devices may be managed remotely using a mobile or other networked device from anywhere with an internet connection. a. Smart Home b. Smart City c. Smart Class d. None of the above	1

6.	_____ helps us to summarise all the key points into one single Template so that in future, whenever there is need to look back at the basis of the problem, we can take a look at the this and understand the key elements of it. a) 4W Problem canvas b) Problem Statement Template c) Data Acquisition d) Algorithm	1
7.	Statement1 : The data with which the machine can be trained is the testing data Statement2 : The data with which the model is evaluated is the training data a) Statement1 is correct and Statement2 is incorrect b) Statement2 is correct and Statement1 is incorrect c) Both Statement1 and Statement 2 are correct d) Both Statement1 and Statement 2 are incorrect	1
8.	Which of the following is an example of rule based approach? a) Pixel it activity b) Decision trees c) Histogram d) Illustration diagram	1
9.	Which approach is commonly used when we have a known dataset or labeled dataset? a) Supervised b) unsupervised c) Rule based d) Learning based	1
10.	Which of these is NOT used for visualization in AI? a) Sketchy Graph b) Scatter plot c) Ruler d) Bar chart	1
11.	Which of the following are valid sources for collecting data? i) Announcements ii) Surveys iii) Web scraping iv) Application Programming Interface a) i) , ii) and iii) b) i) , ii) and iv) c) ii) , iii) and iv) d) i) , iii) and iv)	1
12.	In -------approach the developer feeds in data along with the answers. a)machine leaning b)Artificial intelligence c)deep learning d)rule based	1
13.	A neural network is a machine learning algorithm based on the model of a human neuron. (i) True/(ii) False	1
14.	AI model works on continuous data. a) Regression b)Classification c) Clustering d)Dimensionality reduction	1
15.	The -----from a neuron sends an impulse to the synapse of another neuron.	1

16.	Observe the given graph and fill in the blank:		1
	_____ the neural network, better is the performance.		
17.	Who was created Python programme?		1
18.	Write any two standard data types of python .		1 (0.5+0.5)
19.	Suresh has written following python code. This code is showing error, help Suresh to rectify the error. Underline the error and rewrite the code. a=10 20=b a+b=sum show (sum)		1
20.	Match the Column 'A' with Column 'B' for the next 4 questions		1 marks each
	Column A	Column B	
	a) + (Addition)	(i) Comparison operators	0.25
	b) = =	(ii) Logical operators	0.25
	c) NOT	(iii) Assignments Operators	0.25
	d) + = (Add AND)	(iv) Arithmetic operators	0.25
21.	Write the output of the following python statements. (i) print('Good Morning, India') (ii) print(0.25*0.5*2.5)		1 (0.5+0.5)
22.	Write the output of the following python statements 5 i) print('Sunday' + 'Monday' + 'Holiday') ii) print(3* * 4)		1 (0.5+0.5)
23.	What are the different modes for coding in python?		1 (0.5+0.5)
24.	List down any two types of sequence datatypes in python		1 (0.5+0.5)

SECTION B: SUBJECTIVE TYPE QUESTIONS

I. Answer any 7 out of the given 9 questions   **2*7=14 MARKS**

25.	How do you understand whether a machine/application is AI based or not? Explain with the help of an example.	2
26.	If you do an image search for vacations on a popular search engine, the first few searches mostly return the picture of beaches. What is the concern here? Explain.	2
27.	Ajay wants to access data from various sources. Suggest him any two points that he needs to keep in mind while accessing data from any data source.	2
28.	Describe decision tree.	2
29.	Sirisha and Divisha want to make a model which will organize the unlabeled input data into groups based on features. Which learning model should they use and why?	2
30.	Define any Two (i) Input Layer (ii) Hidden Layer (iii) Output Layer	2
31.	Write the syntax for input and output functions in python	2
32.	Define the following with example a)keyword b)Identifier	2
33.	Identify and write the name of variables used in the following python program . **player_name = 'Sachin'** **century = 51** **runs = 15000** **print('Players name is ', player_name)** **print('He made',century,'centuries')** **print(runs,' Runs is the world record')** **book = 'Autobiography'** **price = 450** **print('lets purchase the book', book)** **print('Its cost only ', price,' Rs')**	2

II. Answer any 3 out of the given 5 questions 4*3=12 MARKS

34.	Explain the ethical concerns related to the adoption of AI systems.	4
35.	Akhil wants to learn how to scope the problem for an AI Project. Explain him the following: (a) 4W Problem Canvas (b) Problem Statement Template	4
36.	Explain the structure of Artificial Neural Network with figure.	4
37.	Define data type in Python programming language. Explain Sequence data types with example	4
38.	Write a Python program to do arithmetic addition, subtraction, multiplication and division. The input data is to be entered by the user. Explain different types of division operators with the same program	4

Answer Key

1.	c) Both Statement1 and Statement2 are correct1	1
2.	c) Computer Vision	1
3.	a) 17 , 2015 , 2030	1
4.	a) Gender bias	1
5.	a. Smart Home	1
6.	b) Problem Statement Template	1
7.	d) Both Statement1 and Statement 2 are incorrect	1
8.	b) Decision trees	1
9.	c) Rule based	1
10.	c)Ruler	1
11.	c) ii) , iii) and iv)	1
12.	a)machine leaning	1
13.	True	1
14.	a)Regression	1
15.	Axon	1
16.	Large NN	1
17.	Guido Van Rossum	1
18.	Numbers, Sequence, sets, maps (Any two)	1
19.	Correct Code- a=10 b=20 sum=a+b print(sum)	1

20.	(i) + (Addition) (i) Arithmetic operators (ii) = = (ii) Comparison operators (iii) NOT (iii) Logical operators (iv) + = (Add AND) (iv) Assignments Operators	1
21.	(i) Good Morning, India (ii) 0.3125	1 (0.5+0.5)
22.	i. SundayMondayHoliday ii. 81	1 (0.5+0.5)
23.	In the Python programming language, there are two ways in which we can run our code: 1. Interactive mode 2. Script mode	1 (0.5+0.5)
24.	String, List, Tuple (Any Two)	1 (0.5+0.5)
25.	Any machine that has been trained with data and can make decisions/predictions on its own can be termed as AI. Eg:The bot or the automation machine is not trained with any data is not an AI while a chatbot that understands and processes human language is an AI. (1 mark for correct explanation; ½ mark for example of AI; ½ mark for example of not AI)	2
26.	In the given scenario, we are concerned about the bias. When we talk about a machine, we know that it is artificial and cannot think on its own. It can have intelligence, but we cannot expect a machine to have any biases of its own. Any bias can transfer from the developer to the machine while the algorithm is being developed. (1 mark for mentioning the term bias; 1 mark for the correct explanation)	2
27.	While accessing data from any of the data sources, following points should be kept in mind: 1. Data which is available for public usage only should be taken up. 2. Personal datasets should only be used with the consent of the owner. 3. One should never breach someone's privacy to collect data. 4. Data should only be taken from reliable sources as the data collected from random sources can be wrong or unusable. 5. Reliable sources of data ensure the authenticity of data which helps in the proper training of the AI model. 6. Data should be relevant to the problem. (any two; 1 mark for each valid point)	2
28.	• Decision tree is the most powerful and popular tool for classification and prediction.	2

	• It made up of several nodes with top-down approach • A Decision tree is a flowchart like tree structure. • The basic structure of a Decision Tree starts from the root which the point where the decision tree starts. From there, the tree diverges into multiple directions with the help of arrows called branches. • Each internal node denotes a test on an attribute, each branch represents an outcome of the test, and each leaf node (terminal node) holds a class label. (0.25 Marks for each point)	
29.	Clustering model is used to organize the unlabeled input data into groups based on features. Clustering is an machine learning algorithm which can cluster unknown data according to the patterns or trends identified out of it. The patterns observed might be the ones which are known to the developer or it might even come up with some unique patterns out of it. (1 mark for identifying the name of the algorithm and 1 mark for explanation)	2
30.	The first layer of a Neural Network is known as the **input layer**. The job of an input layer is to acquire data and feed it to the Neural Network. No processing occurs at the input layer. **Hidden layers** are the layers in which the whole processing occurs. Their name essentially means that these layers are hidden and are not visible to the user. Each node of these hidden layers has its own machine learning algorithm which it executes on the data received from the input layer. **Output Layer** – Accepts final processed data from hidden layer. (Any Two 1 Mark Each)	2
31.	**Input in Python** using input()function. Input refers to the data entered by the user of program. Python provides built in functions for defining input & output. Syntax of input function **input([prompt]),**where prompt is the string you want to display **Output in python** using print() function. The syntax of print function is **print(expression/constant/variable)** Print evaluates the expression before printing it on the monitor. Print statement outputs an entire(complete) line and then goes to next line for subsequent outputs. To print more than one item on a single line, comma may be used.	2

| 32.	a)**Keywords** are the reserved words in Python used by Python interpreter to recognize the structure of the program. Eg:if, elif, while,break etc b) An **Identifier** is a name given to entities like class, functions, variables etc. It help to differentiate one entity from another. Keywords cannot be used as identifier Eg: x=10 where x is a variable,x is an identifier	2
33.	player_name, century, runs, book, price	2
34.	**1. Unemployment** This is very the important topic of debate. Many says that AI adoption can increase the jobs and employment opportunities, many says that it reduces the employment and takes many jobs from human being and many says there is no effect of AI on employment. Do a research on this topic on google. **2. Increasing Inequalities** By adopting AI, results in a reduction in the number of people required for particular jobs. It will definitely affect the economy and increase the gap in the economy hence increase inequalities. **3. Negative Adoptions** Negative adoptions are part of our life. The negative minded community like hackers, terrorists and some other mafias can use this technology for some other purposes and misuses them. **4. Black Box problem** The black box problem refers to the situation that is created by a system itself and the developer of system cannot resolve them. This happens quite often with AI systems.	4 (1+1+1+1)
35.	The 4Ws problem canvas is the basic template while scoping a problem and using this canvas, the picture becomes clearer while we are working to solve it. a) Who: The "Who" block helps you in analyzing the people getting affected directly or indirectly due to it? Under this, you find out who the 'stakeholders' to this problem are and what you know about them. Stakeholders are the people who face this problem and would be benefitted with the solution. b) What: Under the "What" block, you need to look into what you have on hand. At this stage, you need to determine the nature of the problem. What is the	

problem and how do you know that it is a problem?

c) Where: In this block, you need to focus on the context/situation/location of
the problem. It will help you look into the situation in which the problem arises, the
context of it, and the locations where it is prominent.

d) Why: in the "Why" canvas, think about the benefits which the stakeholders
would get from the solution and how would it benefit them as well as the society.

Problem Statement Template

Our	[stakeholders]	Who
Have a problem that	[need]	What
When/while	[context/ location/ situation]	Where
An ideal solution would be	[solution]	Why

(½ mark each for explanation of 4w s; 2 marks for drawing the problem statement template with correct words in it or explaining the problem statement template)

36.
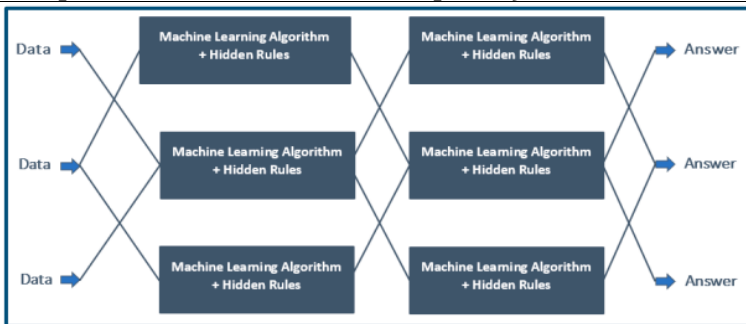
This is a representation of how neural networks work. A Neural Network is divided into multiple layers and each layer is further divided into several blocks called nodes.

Each node has its own task to accomplish which is then passed to the next layer.

The first layer of a Neural Network is known as the input layer. The job of an input layer is to acquire data and feed it to the Neural Network. No processing occurs at the input layer.

Next to it, are the hidden layers. Hidden layers are the layers in which the whole processing occurs. Their name essentially means

that these layers are hidden and are not visible to the user. Each node of these hidden layers has its own machine learning algorithm which it executes on the data received from the input layer.
The processed output is then fed to the subsequent hidden layer of the network.
There can be multiple hidden layers in a neural network system and their number depends upon the complexity of the function for which the network has been configured. Also, the number of nodes in each layer can vary accordingly.
The last hidden layer passes the final processed data to the output layer which then gives it to the user as the final output.
 Similar to the input layer, output layer too does not process the data which it acquires. It is meant for user-interface.

37. **A data type** is an attribute associated with a piece of data that tells a computer system how to interpret its value. Understanding data types ensures that data is collected in the preferred format and the value of each property is as expected.

   A sequence data type is an ordered collection of items, indexed by positive integers. It is a combination of mutable and non-mutable data types. Three types of sequence data type available in Python are:
   a) Strings
   b) Lists
   c) Tuples

String
String is an ordered sequence of letters/characters. They are enclosed in single quotes (' ') or double (" "). The quotes are not part of string. They only tell the computer where the string constant begins and ends. They can have any character or sign, including space in them.
Example: **name = "AJAY"**
         Long_sent="This is a string"
         Month='January'

Lists
List is also a sequence of values of any type. Values in the list are called elements / items. These are indexed/ordered. List is enclosed in square brackets.
Example: **dob = [19,"January",1990]**

Tuples:
Tuples are a sequence of values of any type, and are indexed by integers. They are immutable. Tuples are enclosed in ().
Example: **t = (5,'program',2.5)**

| 38. | Code:
```python
x=int(input("enter the first number"))
y=int(input("enter the second number"))

#addition
sum=x+y
print("the sum of given two numbers is:",sum)
#Subtraction
diff=x-y
print("the difference of given two numbers is:",diff)
#multiplication
product=x*y
print("the product of given two numbers is:",product)

#division
quotient=x//y
print("the quotient is:",quotient)
remainder=x%y
print("the remainder is:",remainder)
div=x/y
print("the result of division with decimal places:",div)
```

Three types of division operators are '/', '//' and '%' gives the division result with decimal places-floor division, quotient and remainder respectively

The output of the program is
enter the first number10
enter the second number3
the sum of given two numbers is: 13
the difference of given two numbers is: 7
the product of given two numbers is: 30
the quotient is: 3
the remainder is: 1
the result of floor division with decimal places: 3.3333333333333335 | 3+1 |