



**BK BIRLA CENTRE FOR EDUCATION**  
SARALA BIRLA GROUP OF SCHOOLS  
SENIOR SECONDARY CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL  
**POST MID TERM EXAM (2024-25)**  
**ARTIFICIAL INTELLIGENCE (417)**



**Class: IX**  
**Date: 04-01-2025**  
**Adm No: .....**

**Duration: 1 hr.**  
**Max Marks: 25**  
**Roll No. :**

## MARKING SCHEME

**NOTE :** (i) All questions are compulsory.  
(ii) Do as per the instructions given in the questions.

### I. Multiple Choice Questions :

(12 X 1 = 12)

- (1) The fundamental unit of neural network is .....
- (a) Brain                      (b) Nucleus                      (c) **Neuron**                      (d) Axon
- (2) Which of the following are the advantages of neural networks over computers ?
- (a) They have ability to learn by examples  
(b) They have real time high computational rates  
(c) They have more tolerance  
(d) **All of the mentioned**
- (3) Which of the following is an application of Neural Network ?
- (a) Sales forecasting                      (b) Fraud detection  
(c) Speech Recognition                      (d) **All of the mentioned**
- (4) A ..... is a decision support tool that uses a tree-like graph or model of decisions and their possible consequences, including chance event outcomes, resources costs and utility.
- (a) **Decision tree**                      (b) Graphs                      (c) Trees                      (d) Neural Networks
- (5) If Data is represented as “Answer”, Processing is represented as “Data” and Answer is represented as “Processing”, which of the following can be related to the description of layers in a neural network ?
- (a) Input Layer -> Data; Output Layer -> Processing; Hidden Layer -> Answer  
(b) Input Layer -> Processing; Output Layer -> Data; Hidden Layer -> Answer  
(c) **Input Layer -> Answer; Output Layer -> Processing; Hidden Layer -> Data**  
(d) Input Layer -> Answer; Output Layer -> Data; Hidden Layer -> Processing
- (6) Reena wants to know about the three layers of the neural network. Which of the following statement is TRUE about the layers of neural networks ?
- (a) Input Layer (Corresponds to Axon in a neuron) -> Hidden Layer (Extraction is done) -> Output Layer (Corresponds to Dendrites)  
(b) Hidden Layer (Extraction is done) -> Input Layer (Corresponds to Axon in a neuron) -> Output Layer (Corresponds to Dendrites)  
(c) Hidden Layer (Corresponds to Dendrites) -> Input Layer (Corresponds to Axon in a neuron) -> Output Layer (Extraction is done)  
(d) **Input Layer (Corresponds to Dendrites) -> Hidden Layer (Extraction is done) -> Output Layer (Corresponds to Axon in a neuron)**
- (7) What symbol is used in Python to assign values to a variable ?
- (a) **equals =**                      (b) plus +                      (c) forward slash /                      (d) asterisk \*

- (8) What will be the output ?  
`name = "Python"`  
`print(name)`  
 (a) **Python** (b) "Python" (c) Name (d) (name)
- (9) What is an input function in Python ?  
 (a) **A function that allows us to ask the user to enter some data.**  
 (b) To plug in something  
 (c) Data displayed on a screen (d) A function None of the above
- (10) Which symbol do we use if we want to add a comment to our code ?  
 (a) @ (b) # (c) \* (d) &
- (11) To create a variable named `new_var` and assign it a value of 81 divided by 9, which statement would you use ?  
 (a) `new_var = 81\9` (b) `new_var = '81/9'`  
 (c) `new_var = '81\9'` (d) **`new_var = 81/9`**
- (12) Numbers with a decimal point belong to a type called .....  
 (a) Pointing (b) Integers (c) decimal (d) **float**

**II. Short Answer Type Questions : (Answer any four) (4 X 2 = 8)**

1. Write at least two differences between Decision Trees and Neural Networks.

**Ans. :**

Feature	Decision Trees	Neural Networks
<b>Structure</b>	Tree-like, with nodes and branches	Layered network of neurons
<b>Interpretability</b>	High interpretability and transparency	Low interpretability (black-box model)
<b>Performance and Scalability</b>	Works well on simpler datasets, prone to overfitting	Works well on large, complex datasets, handles non-linear relationships

**Decision Trees** are simpler, more interpretable models suitable for problems with clearly defined rules, while **Neural Networks** are more powerful, complex models capable of learning intricate patterns but are harder to interpret.

2. Compare Biological Neural networks with Artificial Neural Networks.

**Ans. :**

Biological neural networks are highly efficient, adaptable, and fault-tolerant systems capable of learning from small amounts of data and performing complex cognitive tasks. In contrast, artificial neural networks are inspired by biological systems but are much more simplified, requiring large datasets and significant computational power to train, yet they can outperform biological systems in specific, well-defined tasks like image recognition and natural language processing.

3. Write any two advantages and disadvantages of Artificial Neural Networks.

**Ans. :**

**Advantages :**

Storing information on the entire network  
The ability to work with inadequate knowledge  
It has fault tolerance  
Ability to train machine  
Parallel processing machine

**Disadvantages :**

Hardware dependence  
Unexplained functioning of the network  
Assurance of proper network structure  
The difficulty of showing the problem to the network

4. What is the difference between interactive mode and script mode in Python ? Explain with examples.

**Ans. :***1. Interactive Mode:*

Interactive mode is a way of using Python where the user can write and execute individual lines of Python code one at a time. This mode is typically used for quick testing, learning, or experimenting with code snippets. It provides immediate feedback as the code is executed.

**Eg. :**

```
>>> print("Hello, Python!")  
Hello, Python!
```

*2. Script Mode:*

Script mode is used to write and execute a complete Python program. The user writes the code in a Python file (with a .py extension) and then runs the entire script at once. Script mode is used for more complex, production-level code.

**Eg. :**

```
x = 10  
y = 20  
print(x + y)  
print("Hello from Script Mode!")
```

5. “Comments are an easy way to enhance readability and understandability of a program”. Which operators are used to write comments in Python ? Elaborate with examples.

**Ans. :**

In Python, **comments** are used to annotate code, making it easier to understand and maintain. They are especially helpful for explaining the purpose of code, describing complex logic, or providing context for future developers (or yourself) who may work with the code later.

Python uses the following operators for writing comments:

**1. Single-Line Comments:**

Single-line comments are used when you want to add a comment on a single line. These comments are preceded by the **hash symbol (#)**.

**2. Multi-Line Comments:**

Python does not have a specific multi-line comment syntax like some other languages (e.g., `/* */` in C or Java). However, there are two common ways to write multi-line comments in Python:

(a) Using Multiple # Symbols:

To write comments that span multiple lines, you can use the # symbol at the beginning of each line.

- **Example:**

```
python
```

```
Copy code
```

```
# This is a multi-line comment
```

```
# that is written using multiple
```

(b) *Using Triple Quotes (''' or ''')*:

Triple quotes (''' or ''') are typically used for multi-line strings or docstrings, they can also be used as a multi-line comment.

```
'''
```

```
This is a multi-line comment.
```

```
It spans several lines and is enclosed within triple single quotes.
```

```
Python will ignore this entire block of text as it is a comment.
```

```
'''
```

6. Mahak has just joined a bank. She has been asked to write a program for calculating simple interest for the customers. Help her in writing a Python code for the same.

**Ans. :**

```
# Function to calculate Simple Interest
```

```
def calculate_simple_interest(principal, rate_of_interest, time_period):
```

```
# Calculate Simple Interest using the formula
```

```
simple_interest = (principal * rate_of_interest * time_period) / 100
```

```
return simple_interest
```

```
# Input from the user
```

```
principal = float(input("Enter the principal amount (P): "))
```

```
rate_of_interest = float(input("Enter the rate of interest (R): "))
```

```
time_period = float(input("Enter the time period in years (T): "))
```

```
# Calculate Simple Interest
```

```
interest = calculate_simple_interest(principal, rate_of_interest, time_period)
```

```
# Output the result
```

```
print("The Simple Interest is: {interest}")
```

### III. Long Answer Type Questions : (Answer any two)

(2 X 2.5 = 5)

1. Write and explain any five applications of Neural networks.

**Ans. :**

Fraud detection : ANNs are now used to analyse credit card transaction to detect likely instances of fraud

Speech Recognition :

Pattern Recognition ; many neural networks have been developed for automatic recognition of handwritten characters, either letters or digits.

Signature Verification Application

Human face Recognition : It is one of the biometric methods to identify the given face.

Monitoring Robotic factories : Automated and robotic factories are now being monitored by ANNs that control machinery, adjust temp. settings, diagnose malfunctions and more.

Marketing

Banking and Finance

Medicine

2. Write and explain any five applications of Python.

**Ans. :**

- Amazon uses Python to analyse customer's buying habits and search patterns.
- Facebook uses Python largely to process images.
- Google uses Python in its search systems.
- Youtube uses Python for its video sharing service.
- Applications like Instagram, Spotify and Bit torrent use Python too.
- NASA uses Python for scientific programming tasks.
- Python is used in artificial Intelligence systems.

3. Write Python code to input the temperature in Celsius and convert it into Fahrenheit using the formula ( $F = C * 9/5 + 32$ )

**Ans. :**

```
# Input the temperature in Celsius
celsius = float(input("Enter temperature in Celsius: "))
# Convert Celsius to Fahrenheit
fahrenheit = (celsius * 9/5) + 32
# Output the result
print("The temperature in Fahrenheit is: fahrenheit")
```

\*\*\*\*\* ALL THE BEST \*\*\*\*\*