BK BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
SENIOR SECONDARY CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL
ANNUAL EXAMINATION (2024-25)

ARTIFICIAL INTELLIGENCE (843)
MARKING SCHEME

Class : XI SCIENCE/COMMERCE/ARTS **Duration : 2 Hr**
Date : __-02-2024 **Max. Marks : 50**
Admission No.: **Roll No.:**

Section-A

1. Which of these is not an appropriate non-verbal communication at work ? 1
(a) Putting arm around a coworker's shoulder (b) Shaking hands firmly
(c) Looking at the speaker with a smile (d) Standing with an upright posture

2. _____ refers to a group of people who have complementary skills ad work towards a common goal. 1
(a) Group (b) Company **(c) Team** (d) None of these

3. Which of the following statements is true ? 1
(a) Headers are text or images inserted in the bottom margin.
(b) If you insert a footer in one page, it will appear on all pages.
(c) Headers are used to insert borders in a document.
(d) You cannot insert date, time, page number, etc.., in a header or footer.

4. _____ means not to give up and keep going even when a difficult situation comes up. 1
(a) Values (b) Attitude **(c) Perseverance** (d) None of these

5. _____ comes from natural sources or processes that are constantly replenished. 1
(a) Non Renewable energy **(b) Renewable energy** (c) Green Energy (d) None of these

6. Generative AI focusses on: 1
(a) Optimizing computer algorithms (**b) Creating new data like text, images, or code**
(c) Analyze large datasets for patterns (d) Upgrading computer hardware.

7. Assertion / Reason : 1
Statement 1: The job market for AI is saturated, making it difficult to find a job.
Statement 2: The demand for AI professionals is high, but the supply of qualified candidates is limited.
(a) Statement 1 is correct, but statement 2 is incorrect.
(b) Statement 1 is incorrect, but statement 2 is correct.
(c) Both the statements are correct.
(d) Both the statements are incorrect.

8. Statement 1: Comments are essential for writing good python code. 1
Statement 2: Comments explain the purpose of code sections and improve maintainability.
(a) Statement 1 is correct, but statement 2 is incorrect.
(b) Statement 1 is incorrect, but statement 2 is correct.
(c) Both the statements are correct.
(d) Both the statements are incorrect.

9. Statement 1: Design thinking is a linear process with clearly defined steps. 1
Statement 2: Each phase of design thinking builds upon the previous one in a sequential order.
(a) Statement 1 is correct, but statement 2 is incorrect.
(b) Statement 1 is incorrect, but statement 2 is correct.
(c) Both the statements are correct.
(d) Both the statements are incorrect.

10. Explain communication cycle briefly. 1

Ans: The communication cycle refers to the process of exchanging information between a sender and a receiver. It involves six key elements: **sender**, **message**, **encoding**, **channel**, **decoding**, and **receiver**. Feedback from the receiver completes the cycle, ensuring the message is understood.

11. At the animal shelter, after counting the cats, they are weighed. The counts are _____ values while weights are _____ values. 1
(a) continuous, discrete (b) continuous, qualitative **(c) discrete, continuous**
(d) qualitative , continuous

12. Who coined the term 'Machine Learning' ? 1

Ans: Arthur Samuel in 1959.

13. Define the following : (a) Intent (b) Entity 1

Ans: (a) In the context of natural language processing (NLP) and conversational AI, an **intent** refers to the purpose or goal behind a user's input or query.
(b) An **entity** is a specific piece of information or a data point that provides context to an intent. Entities represent the key elements within a user's input that help define or refine the intent

14. Define : Ethics 1

Ans: It is defined as the moral principles governing the behavior or actions of an individual or a group.

Section- B

15. What are the three types of business activities ? Explain any two. 2

Ans: Manufacturing, Trading & Service.

16. **Mention some policy initiatives for green economy in India.** 2

Ans: 1. National Bio-Energy Mission, 2. Sustainable Agriculture Initiatives, 3. Clean Energy Initiatives, 4 Afforestation Programs, 5. Waste Management and Circular Economy, 6) Carbon Markets and Emissions Trading:

17. Imagine you are creating a new AI assistant for your classmates. What tasks would you want it to help you with in your studies ? How would this AI assistant use its knowledge to be helpful and informative ? 2

Ans: **Answering Study-Related Questions:** It could explain difficult concepts, solve problems, and provide summaries of topics.
Organizing Study Schedules: It could create personalized timetables, remind about deadlines, and suggest effective study techniques.
The AI assistant would use its knowledge by analyzing the curriculum, accessing reliable resources, and using machine learning to adapt to individual learning needs, making studies easier and more efficient.

18. A social bot is an agent that communicates more or less autonomously on social media, often with the task of influencing the course of discussion and / or the opinions of its readers. Divide the class into two groups and conduct a debate on: 2
(a) “Are social bots ethical ?”
(b) Is using Chatbots as therapy bots ethical ?

Ans: **Topic 1: "Are social bots ethical?"**

1. **Group A (For Social Bots):**
   - Highlight the benefits of social bots in spreading awareness, promoting products, and helping in social campaigns.
   - Emphasize their utility in monitoring and managing online platforms, reducing workload, and providing timely responses.
2. **Group B (Against Social Bots):**
   - Argue about the risks of manipulation, misinformation, and potential harm to public opinion.
   - Discuss the ethical concerns of using bots to impersonate humans and manipulate social discourse.

Topic 2: "Is using Chatbots as therapy bots ethical?"

1. **Group A (For Therapy Chatbots):**
   - Point out how therapy bots provide mental health support to those who can't afford traditional therapy or prefer anonymity.
   - Mention the advancements in AI that make chatbots empathetic and efficient.
2. **Group B (Against Therapy Chatbots):**
   - Highlight the ethical issues of replacing human therapists with bots, which might lack deep understanding and emotional sensitivity.
   - Question the reliability and accountability of AI in handling sensitive mental health cases.

19. Write a Python program to print the table of a given number. (Using any loop) 2
Example: If a user enter 2, then the following output will be displayed.
2 x 1 = 2
2 x 2 = 4
…
2 x 10 =20

Ans:
```
number = int(input("Enter the number: ))
print(f"Multiplication Table of {number}")
for i in range(1, 11):
 print(f"{number} x {i} = {number * i}")
```

20. Elaborate the five phases of Design Thinking. 2

- **Empathize:**

This phase focuses on understanding the users' needs, problems, and emotions through research, interviews, and observations. It helps gain insights into the user experience.

- **Define:**

In this phase, the information gathered is analyzed to clearly define the problem statement. It involves identifying the key challenges and user requirements.

- **Ideate:**

During this stage, creative brainstorming is conducted to generate innovative ideas and solutions. The focus is on thinking out of the box to address the defined problem.

- **Prototype:**

Prototypes are developed to represent the solutions. These can be simple models or mock-ups that allow designers to test their ideas and identify potential improvements.

- **Test:**

In the final phase, the prototypes are tested with users to gather feedback. Iterative improvements are made based on user responses to ensure the solution effectively addresses the problem.

21. Describe the 5W1H model. 2

Ans: The 5W1H model is a problem-solving and communication tool used to gather comprehensive information about a situation. It stands for:

1. **Who**: Identifies the people involved or affected by the situation.
2. **What**: Describes the event or issue at hand.
3. **When**: Specifies the time or duration of the event.
4. **Where**: Indicates the location of the occurrence.
5. **Why**: Explains the reasons or causes behind the event.
6. **How**: Details the process or methods used to address the situation.

This model helps in understanding and analyzing problems, ensuring that all relevant aspects are considered for effective decision-making.

22. The ages of a group of people in a community are : 25,28,30,35,40,45,50,55,60,65. Write a Python program to calculate the mean, median and mode of the ages. 2

Ans:
```
import statistics
ages = [25, 28, 30, 35, 40, 45, 50, 55, 60, 65]
mean_age = statistics.mean(data)
median_age = statistics.median(data)
mode_age = statistics.mode(data)
mean, median, mode = calculate_statistics(ages)
print("Mean:", mean)
print("Median:", median)
print("Mode:", mode)
```

23. A= `[1 2]` `[3 4]` B= `[5 6]` `[7 8]` C= `[ 9 10]` `[11 12]` 2

Find the sum of the matrices, A, B and C:
A + (B + C)

Ans:
```
Sum of matrices A, B, and C:
[[15 18]
 [21 24]]
```

24. List the difference between Artificial Intelligence and Machine Learning. Mention at-least three points. 2

Ans:

Aspect	Artificial Intelligence (AI)	Machine Learning (ML)
Definition	Simulation of human intelligence processes by machines.	A subset of AI that focuses on algorithms that enable learning from data.
Scope	Encompasses various subfields like natural language processing, robotics, and computer vision.	Primarily concerned with creating models that learn from data and make predictions.
Approach	Can be rule-based, operating without learning from data.	Requires data to identify patterns and improve decision-making over time.

25. Differentiate between: 2
Extraction based and Abstraction based summarization.

Ans:

Aspect	Extraction-Based Summarization	Abstraction-Based Summarization
Definition	Involves selecting and extracting key sentences or phrases directly from the source text to create a summary.	Involves generating new sentences that capture the main ideas of the source text, often rephrasing and paraphrasing.
Approach	Focuses on identifying important parts of the text without altering them.	Emphasizes understanding the content and generating a coherent summary.
Output	Produces a summary that retains the original phrasing and structure.	Produces a summary that may differ significantly in wording and structure from the original text.
Complexity	Generally simpler and less computationally intensive.	More complex as it requires understanding and rephrasing of the content.

26. What do you understand about AI bias ? Discuss in detail with some examples. 2

Ans: **AI Bias** refers to the presence of systematic and unfair discrimination in artificial intelligence systems, often arising from the data used to train these systems or from the design of the algorithms themselves.

Sources of AI Bias

Data Bias:

Algorithmic Bias:

Labeling Bias:

Examples of AI Bias

Criminal Justice:

Healthcare:

Advertising:

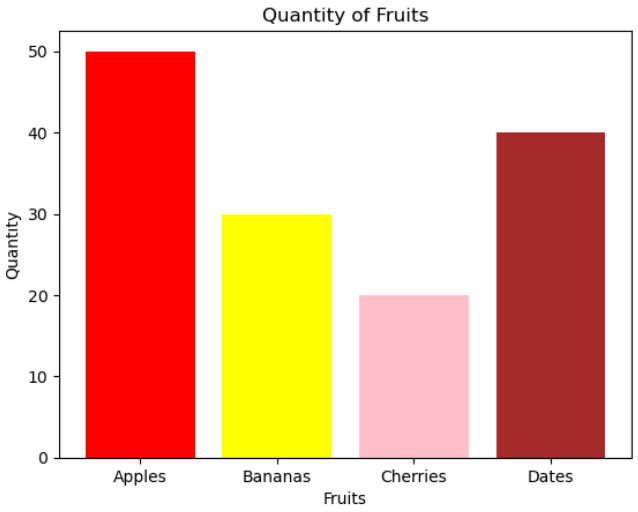
Section- C

27. Write a python program / statements to create a dataframe ‘df1’ for the following data. 3

	Name	Age	Designation
0	Alice	28	Engineer
1	Bob	34	Manager
2	Charlie	25	Analyst
3	Diana	30	Designer

Ans:
```
import pandas as pd
data = {
   'Name': ['Alice', 'Bob', 'Charlie', 'David'],
   'Age': [28, 34, 25, 42],
   'Designation': ['Engineer', 'Manager', 'Analyst', 'Director']
}
df1 = pd.DataFrame(data)
print(df1)
```

28. Write a python code to create a bar graph of the following data: 3
Note: show xlabel, ylabel and title also



29. Define K-Nearest Neighbour (KNN). Write two advantages and dis-advantages of it. 3
Name any three applications of KNN.

Ans: K-Nearest Neighbour (KNN) is a simple, non-parametric, and supervised machine learning algorithm used for classification and regression tasks.

Advantages of KNN :

Simplicity and Ease of Implementation

No Training Phase

Disadvantages of KNN:

Computationally Intensive

Sensitivity to Irrelevant Features

Applications of KNN

Recommendation Systems

Image Recognition

Medical Diagnosis

30. List all the phases of Natural Language Processing and explain each type. 3

Ans: Lexical Analysis, Syntactic Analysis, Semantic Analysis, Discourse Analysis, Pragmatic Analysis.

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