BK BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
SENIOR SECONDARY CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL

MID TERM EXAMINATION 2024-25
ARTIFICIAL INTELLIGENCE

Class: VIII   **Duration: 2 hrs.**
Date: 19.09.2024   **Max Marks: 50**
Name: ……………………………   **Exam No. :**

General Instructions:
1. *Please read the instructions carefully.*
2. *This Question Paper consists of 16 questions in two sections: Section A & Section B.*
3. *Section A has Objective type questions (MCQ, Fill in the blanks) whereas Section B contains Subjective type questions.*
4. *All questions of a particular section must be attempted in the correct order.*
5. *SECTION A - OBJECTIVE TYPE QUESTIONS (24 MARKS):*
   - i. *This section has 02 questions.*
   - ii. *Marks allotted are mentioned against each question/part.*
   - iii. *There is no negative marking.*
   - iv. *Do as per the instructions given.*
6. *SECTION B – SUBJECTIVE TYPE QUESTIONS (26 MARKS):*
   - i. *This section has 14 questions.*
   - ii. *A candidate has to do 11 questions.*
   - iii. *Do as per the instructions given.*
   - iv. *Marks allotted are mentioned against each question/part.*

MARKING SCHEME

SECTION A: OBJECTIVE TYPE QUESTIONS

I. Multiple Choice Questions: (Answer any twenty)   **(20 X 1 = 20)**

(1) Which of the following is an example of a reinforcement learning task ?
   - (a) Training a self-driving car to navigate the roads
   - **(b) Teaching a robot to play a game like chess**
   - (c) Optimizing a portfolio of investments
   - (d) Detecting fraudulent transactions in real time

(2) Which of the following is NOT a type of machine learning ?
   - (a) Supervised learning   (b) Unsupervised learning
   - (c) Reinforcement learning   **(d) Deep Learning**

(3) Which of the following is NOT a characteristics of machine learning ?
   - (a) Ability to learn from data   **(b) Ability to make predictions**
   - (c) Ability to reason and make decisions   (d) Ability to adapt to new situations

(4) Which of the following applications of machine learning is having a significant impact on the world ?
   - (a) Self driving cars   (b) Face recognition   (c) Fraud detection   **(d) All of these**

(5) In unsupervised learning, the algorithm is provided with which of the following ?
   - (a) A set of labelled training data   **(b) A set of unlabelled training data**
   - (c) A set of rules and instructions   (d) A human expert to guide the learning process

(6) What is the primary goal of data privacy ?
  (a) to protect personal data from unauthorized access, use, disclosure, alteration or destruction
  (b) to ensure that personal data is collected, processed and used in a fair and lawful manner
  (c) to empower individuals with control over their personal data
  (d) all of the above

(7) What is the purpose of transforming data into information ?
  (a) to make the data easier to store   (b) to make the data easier to analyze
  (c) to give the data meaning and context (d) to make the data more valueable

(8) Which of the following is an example of quantitative data ?
  (a) the colour of a product   (b) the size of a customer's business
  (c) the number of items sold in a day   (d) the customer's opinion of a product

(9) What is data privacy ?
  (a) the protection of personal information from unauthorised access are use
  (b) the sharing of personal information with others
  (c) the collection of personal information for marketing purposes
  (d) the sale of personal information to third parties

(10) Which of the following is a way to protect your data privacy ?
  (a) using strong passwords (b) only sharing personal information with trusted sources
  (c) using a virtual private network (VPN) **(d) all of the above**

(11) A leading multinational company that operates on a chain of hypermarkets and grocery stores deployed an AI application to make it easier for employees to keep their stores running smoothly. They used thousands of video cameras, weighted sensors on shelves, and other technologies that can tell employee when certain products are starting to go bad. One of the tasks of the application is to identify bananas that had started to turn brown, eliminating the need for employees to manually inspect fruit. Which of the following domains is used to achieve this ?
  (a) Data sciences   **(b) Computer Vision**
  (c) Natural Language Processing   (d) Fuzzy logic

(12) Statement 1 : The drone technology helps farmers spot intrusions, crop diseases, predict the amount of crop production, and saves time and avoids the difficulties of physical manual inspections.
  Statement 2 : The statement given above is an example of Natural language Processing.
  (a) Both Statement 1 and Statement 2 are correct
  (b) Both Statement 1 and Statement 2 are incorrect
  (c) Statement 2 is correct and Statement 1 is incorrect
  (d) Statement 1 is correct and Statement 2 is incorrect

(13) ……………… are images that contain text you have to type in before you can access a website.
  (a) CAPTCHAS   (b) PNG   (c) JPG   (d) TIFF

(14) Which of the following is an application of computer vision ?
  (a) Robotics   (b) Medicine   (c) Security   **(d) All of these**

(15) Assertion (A) : Automatic car allows you to identify objects at the back and raise an alarm while reversing.
  Reason (R) : Automatic car won't move back if there is any other object at the back.
  (a) Both A and R are true and R is the correct explanation of A.
  (b) Both A and R are true but R is not the correct explanation of A.
  (c) A is true but R is false   (d) A is false but R is true

(16) …………………… is a branch of artificial intelligence that deals with the interaction between computers and humans using the natural language.
  (a) Computer Vision   **(b) Natural language processing**
  (c) Computer language Processing (d) Human Language Processing

(17) …………………. Bots work around a script which is programmed in them.
  (a) Script   (b) Smart   (c) Sentiment   (d) Analysis

(18) …………………… analysis is the interpretation and classification of emotions (positive, negative and neutral) within text data using text analysis techniques.
  (a) Natural   (b) Computer   **(c) Sentiment**   (d) Language

(19) No or little language processing skills are required while making …………. bots.
  (a) Script bot   (b) Smart bot   (c) Stem bot   (d) Language bot

(20) The …………………. vacuum cleaner robot is a little, self-contained cleaning robot that you can control to clean rugs, carpets and floors.
  (a) Roomba   (b) Sophia   (c) Nao   (d) Eagle 2.0

(21) The …………………….. has been called an "Ultra compact assistant robot" due to its small size and kind demeanour.
  (a) Roomba   (b) Sophia   **(c) Wakamaru**   (d) Nao

(22) ………………… bots are used to automate repetitive operations like filling out forms to post advertisements on websites.
  (a) Hardware   (b) Internet   **(c) Software**   (d) Multiuser

(23) ………………. is an artificially intelligent robot toy with a strong personality and a range of emotions.
  (a) Sophia   **(b) Cozmo**   (c) Nao   (d) Eurobot

(24) Among the top producers of weeding robots worldwide are Nexus Robotics and Naio Technologies, both from :
  (a) Spain   (b) USA   (c) Japan   **(d) France**

(25) Which of the following is the first Humanoid Robot teacher in India ?
  (a) Sophia   **(b) Eagle 2.0**   (c) Roomba   (d) None

II. Fill in the blanks. (Answer any four)   (4 X 1 = 4)

(1) Surgical Robot

(2) Thinking About You

(3) Female pedestrian

(4) Ethics

(5) Deep Fakes

SECTION B: SUBJECTIVE TYPE QUESTIONS

III. Short Answer Type Questions : (Answer any seven)   **(7 X 2 = 14)**

(1) Differentiate between Artificial intelligence and Machine Learning.

Ans. :

Artificial Intelligence	Machine Learning
The goal is to simulate natural intelligence to solve complex problem	The goal is to learn from data on certain tasks to maximize the performance of the given task.
It leads to developing a system to mimic humans to respond in certain circumstances.	It involves creating self-learning algorithms.

(2) Define Ethics. Give two examples where AI is being used for good.

Ans. : The moral principles governing the behavior or actions of an individual or a group. It is used for improving health information, improving consistency of healthcare information, Predicting

human wild life conflict using AI, inform dam and barrage water releases and build early warning system to risk of disasters.

(3) Your younger sibling has spent a lot of time in preparing a 3D model of India Gate which is 3 ft tall and kept it on ground for safety concerns. Your mother started the autonomous robot to clean the floor and it tries to clean the area near the model but it falls and breaks.

(a) Who can be held liable for damages caused by autonomous systems ?

Ans. : Manufacturer of the Autonomous Robot

- **Product Liability:** The manufacturer could be held liable if the damage was caused due to a design flaw, manufacturing defect, or failure to provide adequate warnings or instructions. If the robot was not programmed to detect and avoid obstacles like the 3D model, this could be a case of product liability.

User (Your Mother)

- **Operational Liability:** If your mother operated the robot in a manner inconsistent with the manufacturer's guidelines or failed to supervise its operation properly, she might be held liable for the damages. For example, if the robot was meant to be used only when the area was clear of delicate objects, but your mother started it knowing the model was there, she could be considered responsible.

(b) List two AI Ethics.

Ans. : Be socially beneficial

Avoid creating or reinforcing unfair bias

Be built tested for safety

Be accountable to people

Incorporate privacy design principles

(4) Explain the difference between data and information ?

Ans. : Data : It refers to raw facts, figures and statistics that are collected and stored in a structured and unstructured format.

Information : It is data that has been processed and organized in a way that gives it meaning and context.

(5) What is personal data, and how can you keep your data safe online ? Explain.

Ans. : Personal data refers to any information that can identify an individual, either directly or indirectly

Use Strong, Unique Passwords

2. Enable Two-Factor Authentication (2FA)

3. Be Cautious with Personal Information

4. Use Secure Connections

5. Regularly Update Software

6. Be Aware of Phishing Scams

7. Monitor Your Accounts

8. Use Encryption

9. Be Mindful of Apps and Permissions

10. Backup Your Data

(6) Explain the importance of images in Artificial Intelligence. Give one example in support of your answer.

Ans. :

1. Enhanced Data Representation:
2. Key to Machine Vision:
3. Training Data for Deep Learning:
4. Cross-Modal Learning:
5. Improved Human-Computer Interaction:
6. Support for Creative Applications:
7. Advancements in Healthcare:
8. Enhanced Surveillance and Security:
9. Scientific Research and Exploration:

(7) Most of the virtual assistants like Google assistant, Cortana, Siri, Alexa, etc. have female voices. Do you consider this as a bias ? Why is a female voice chosen over any other and why are other voices not so popular ? Justify it.

Ans. :
Yes, the widespread use of female voices in virtual assistants can be considered a form of gender bias. This bias is rooted in societal norms, stereotypes, and historical associations between women and roles that involve assistance, caregiving, or secretarial work.
Reasons for Choosing Female Voices
1. Cultural and Historical Norms:
2. User Preferences:
3. Market Research:
4. Neutrality and Non-Threatening Perception:

(8) How are robots used in the domestic sector ? Explain with a few examples.

Ans. :
Robots are increasingly becoming a part of the domestic sector, helping to automate household tasks, improve convenience, and enhance the quality of life. Here are some examples of how robots are used in homes:
1. Cleaning Robots
2. Lawn Care Robots
3. Personal Assistants
4. Security Robots
5. Entertainment Robots
6. Assistive Robots

IV. Long Answer Type Questions : (Answer any four) (4 X 3 = 12)
(1) Explain the differences between supervised learning, unsupervised learning and reinforcement learning.

Ans. :
a. **Supervised Learning:** This type of learning involves training a model on a labelled dataset, where each input example is paired with the correct output. The model learns to map inputs to outputs, making predictions on new, unseen data based on its learned patterns. Common algorithms used in supervised learning include linear regression, decision trees, and neural networks.
b. **Unsupervised Learning:** Unsupervised learning aims to find hidden patterns or structures in unlabelled data. The model learns to group similar data points together or extract

meaningful features without predefined labels. Clustering algorithms like K-means clustering and dimensionality reduction techniques such as principal component analysis (PCA) are examples of unsupervised learning.

c. **Reinforcement Learning:** In reinforcement learning, an agent learns to make decisions by interacting with an environment and receiving feedback in the form of rewards or penalties. The goal is to maximize cumulative rewards over time by taking actions that lead to favourable outcomes. Reinforcement learning is often used in applications such as game playing, robotics, and autonomous systems.

(2) As Artificial Intelligent machines become more and more powerful, their ability to accomplish tedious tasks is becoming better. Hence, it is now that AI machines have started replacing humans in factories. While people see it in a negative way and say AI has the power to bring mass unemployment and one day, machines would enslave humans, on the other hand, other people say that machines are meant to erase our lives. If machines over take monotonous and tedious tasks, humans should upgrade their skills to remain their masters always. What according to you is a better approach towards this ethical concern ? Justify your answer.

Ans. : The rise of Artificial Intelligence (AI) and its increasing capability to perform tasks traditionally done by humans presents a significant ethical dilemma. The debate revolves around the potential for AI to cause mass unemployment versus its ability to free humans from monotonous tasks, allowing for skill development and more fulfilling work.

A better approach to the ethical concerns surrounding AI is to embrace the technology while simultaneously investing in human skill development and ethical oversight. This balanced strategy recognizes the potential of AI to improve our lives by eliminating mundane tasks, while also acknowledging the importance of human uniqueness and the need for continuous learning. By preparing workers for an AI-augmented future, we can create a world where machines enhance our capabilities and opportunities, rather than threaten our livelihoods.

(3) What are the privacy risks associated with social media use, and what steps can individuals take to protect their personal information on social media platforms ? Explain.

Ans. :
Social media platforms are widely used for communication, networking, and entertainment, but they also come with significant privacy risks. These risks include:
1. Data Collection and Sharing
2. Identity Theft and Fraud
3. Social Engineering Attacks
4. Data Breaches
5. Lack of Control Over Content
Steps to Protect Personal Information on Social Media
To mitigate the privacy risks associated with social media use, individuals can take several steps to protect their personal information:
1. Adjust Privacy Settings
2. Be Cautious with Sharing Personal Information
3. Use Strong, Unique Passwords
4. Be Vigilant Against Phishing and Scams
5. Regularly Review Account Activity
6. Be Aware of Data Breaches
7. Educate Yourself and Others

(4) Explain any three areas where Computer Vision is being used.

Ans. :

Face Filters : Camera or machine or the algorithm is able to identify the facial dynamics of the person and applies the facial filter selected.

Google's Search by Image : Google lens is an image recognition technology developed by Google,, designed to bring up relevant information related to objects which identifies using visual analysis based on a neural network.

Computer Vision in retail : Retailers can use computer vision techniques to track customers movement through stores, analyse navigational routes and detect walking patterns.

Medical Imaging : Computer supported medical imaging application has been a trustworthy help for physicians.

(5) Compare Script-bot and Smart-bot using any three points.

Ans. :

Script Bot	Smart Bot
Easy to make	Are flexible and powerful
It work around a script which is programmed in them	It work on bigger databases and other resources directly
Mostly are free and are easy to integrate to a messaging platform	It learn with more data
No or little language processing skills	Coding is required to take this up on board
Limited functionality	Wide functionality

(6) Write advantages and disadvantages (three each) of using Robots in Warfare.

Ans. :

Advantages :
- They are capable of making swift judgementsin hectic battle situations
- They can be used in frontline fighting to save human lives
- Instead of training, they can be mass produced and improved
- Military robots can operate in dangerous areas where humans would perish
- Military robots frequently save lives
- They could be quickly changed

Disadvantages :
- Hackers have the ability to turn military robots against the people who created them
- Robotic soldiers can be used as an instrument of oppression by governments
- Without the proper constraints, military robots may make unethetical decisions during military operations that could lead to a significant number of civilian casualties

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