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 (417)

Class: IX **Duration: 2 hrs.**

Date: **Max Marks: 50**

Name: …… **Exam No. :**

MARKING SCHEME

SECTION A: OBJECTIVE TYPE QUESTIONS

Q.(1) Answer any 4 out of the given 6 questions on Employability Skills. **(4 x 1 = 4)**

(i) For successful communication, it is important that the sender keeps his message free from :
(a) Prejudice (b) Complexity
(c) Both (a) and (b) (d) None of the above

(ii) Improving your self-management skills :
(a) **Builds your confidence** (b) Helps in making friends
(c) Both (a) and (b) (d) None of the above

(iii) Which of the following shows your ability to participate as a member of a team ?
(a) Interpersonal skill (b) Communication skill
(c) Both (a) and (b) (d) None of the above

(iv) Which device allows you to collect the hard copy from ?
(a)Printer (b) Scanner
(c) Joystick (d) None of the above

(v) A person who starts an enterprise is :
(a) Manager (b) Organiser
(c) Entrepreneur (d) None of the above

(vi) Which of the following should be our motto to reduce pollution ?
(a) Reuse (b) Reduce
(c) Both (a) and (b) (d) None of these

Q.(2) Answer any 5 questions out of the given 6 questions. **(5 x 1 = 5)**

(i) A humanoid robot known as the first "Robot Citizen" is called
(a) Sophia (b) Clarke (c) Roomba (d) Eliza

(ii) What is Artificial Intelligence ?
(a) Putting your intelligence into the computer
(b) Programming with your own intelligence
(c) Making a machine intelligent
(d) Adding more memory to the computer

(iii) Who is called the Father of Artificial Intelligence ?
(a) John McCarthy (b) Herbort Simon (c) Allen Newell (d) Allan Turing

(iv) Which of the following companies is working on driverless car ?
(a) Tesla (b) Ampere (c) Joule (d) Amazon

(v) Transportation apps like Uber use which of the following to find the fastest route ?
(a) Driver calls the traffic department to know congestion free route.
(b) Driver listens to the radio and gets regular updates on traffic.
(c) Driver surfs through AI enabled maps like google maps on smartphone.
(d) Driver asks for suggestions from the client.

(vi) A program that is used to detect unsolicited and unwanted email and prevent those messages from getting to a user's inbox.

(a) Auto response **(b) Spam Filter**
(c) Email Filter (d) email Blocker

Q.(3) Answer any 5 questions out of the given 6 **questions.** **(5 x 1 = 5)**

(i) Priya went to her hometown. Her hometown does not have all the facilities that are available in the urban area. She has gone there to select a problem which she can help solve there. This is which step of a project cycle.

(a) Problem Scoping (b) Evaluation
(c) Data acquisition (d) Modelling

(ii) Which of the following comes under Problem Scoping ?

(a) System Mapping **(b) 4Ws Canvas**
(c) Data Features (d) Web Scraping

(iii) …….. is the presentation of data in graphical format.

(a) Data Exploration **(b) Data Visualisation**
(c) Data Modelling (d) Data Presentation

(iv) A flowchart needs to represent the situation where for each mark a student is awarded "Pass" or "Fail" ….. the system will consider the mark and if it's 50 or over award "Pass", else it awards "Fail". This is an example of which of the algorithm constructs ?

(a) Decision (b) Loop
(c) Sequence (d) all of the above

(v) Which of the following is a pictorial representation of an algorithm ?

(a) Pseudocode (b) Program
(c) Flowchart (d) Algorithm

(vi) In a flowchart how are symbols connected ?

(a) Symbols do not get connected together in a flowchart
(b) With lines and an arrow to show the direction of flow
(c) With dashed lines and numbers
(d) With solid lines to link events

Q.(4) Answer any 5 questions out of the given 6 questions. **(5 x 1 = 5)**

(i) Which one of the following is not an advantage of machine learning ?

(a) Easily identifies trends and patterns (b) No human intervention required
(c) Handling multidimensional and multi variety data (**d) Data Acquisition**

(ii) A method used to enable machines to classify/predict objects, problems or situations based on labelled data fed to the machine is called

(a) Unsupervised learning **(b) Supervised learning**
(c) Decision Trees (d) None of the above

(iii) …….. learning mimics the network of neurons in a brain.

(a) Machine **(b) Deep**
(c) Reinforcement (d) Supervised

(iv) The fundamental unit of neural network is ……..

(a) Brain (b) Nucleus
(c) Neuron (d) Axon

(v) Which of the following is an application of neural network ?

(a) Sales forecasting (b) Fraud detection
(c) Speech recognition **(d) All of the above**

(vi) A …… is a decision support tool that uses a tree-like graph or model of decisions and their possible consequences, including chance event outcomes, resource costs and utility.

(a) Decision tree (b) Graphs
(c) Trees (d) Neural networks

Q.(5) Answer any 5 questions out of the given 6 questions. **(5 x 1 = 5)**

(i) What is a variable ?

(a) A box (memory location) where you store values
(b) A type of graphics
(c) Data type (d) A type of memory

(ii) A …….. expression is an expression that is either True or False.

(a) Boolean (b) Truth (c) Variable (d) Conditional

(iii) In programming, what is iteration ?

(a) The repetition of steps within a program
(b) The order in which instructions are carried out
(c) A decision point in a program
(d) Testing a program to make sure it works

(iv) What type of loop is used when you know how many times you want to repeat something ?

(a) A WHILE loop (b) An IF function **(c) A FOR loop** (d) A variable

(v) Joining elements together to make a string is called what ?

(a) Combining (b) Connecting **(c) Concatenation** (d) Stringing

(vi) Which of these is best description of a list in Python ?

(a) A list is a collection of data that has an order and can be changed
(b) A list is a lot of variables
(c) A list is used for shopping
(d) A list is a collection of data that cannot hold duplicated data and cannot be changed

SECTION B: SUBJECTIVE TYPE QUESTIONS

Answer any 3 out of the given 5 questions on Employability Skills **(3 x 2 = 6)**

Q. (6) Explain the elements of communication cycle ?

Ans. :

Sender, Idea, Message, Encoding, Communication channel, Receiver, Decoding, Feedback
Sender : It is the person whowants to send the information.
Idea ; The information or ideas the sender wants to share with the receiver.
Receiver : The receiver or the target to whom the information is intended to be sent.
Feedback : The target response to the source information

Q. (7) Define self-management skills. Explain three broad areas influenced by self-management.

Ans. : It is the core skills that governs our attitude and approach towards life further making us self confident when faced with difficult times.

Rational abilities, Personal qualities, Interpersonal skills

Rational abilities : It mean the abilities to understand a problem and then to find a way to effectively solve it.

Personal qualities : It mean personal qualities will be measured.

Interpersonal skills : it include the ability to participate as a member of a team.

Q. (8) What is the difference between hardware and software, in terms of physical existence ? Explain by giving suitable example.

Ans. :

(a) Hardware : All the tangible parts of the computer system, which can be touched and felt are called hardware of the computer system. Eg.: keyboard, monitor, etc.

(b) Software : These are the programs and processes in existence in the system of computer. It is intangible pf the computer system. Eg.: MS Word, MS Excel, etc.

Q. (9) Explain any four rewards of entrepreneurship.
Ans. :
Financial Independence and Profit Potential: One of the most significant rewards of entrepreneurship is the potential for financial success.
Personal Satisfaction and Fulfillment: Building a business from the ground up can bring immense personal satisfaction.
Autonomy and Control: Entrepreneurs have the freedom to make their own decisions, from strategic planning to day-to-day operations.
Opportunity for Innovation and Impact: Entrepreneurship offers the chance to introduce new products, services, or solutions to the market, contributing to innovation and societal progress.

Q. (10) Explain any four factors which cause imbalance in the environment.
Ans. :
Land use changes : Clearing of forests and burning of grasslands for crop cultivation, feeling of trees for commercial purposes, changes in cropping pattern in relation to new farming techniques, new high yielding seeds, use of weedicides, pesticides, fertilisers, irrigational facilities etc.
Constructions and excavations : Constructions of dams, reservoirs and canals, diversion and manipulation of river channels, construction of embankments and dykes to protect the area from floods, construction of road and bridges etc.
Agricultural practices : Mechanisation of agricultural, use of chemical fertilizers, pesticides and insecticides etc.
Weather modification programme : Cloud seeding to induce precipitation, dispersal and clearing of clouds and fogs, checking of hailstorms etc.
Nuclear programmes : Nuclear energy is being used increasingly for constructive as well as destructive purposes.

Answer any 4 out of the given 6 questions on Subject Specific Skills. **(4 x 2 = 8)**
Q.(11) Write any two advantages and disadvantages each of AI.
Ans. :
Advantages:
1. **Increased Efficiency**: AI can automate repetitive tasks, allowing businesses to streamline operations and allocate human resources more effectively.
2. **Improved Decision Making**: AI algorithms can analyze large volumes of data quickly and accurately, providing valuable insights that can support decision-making processes.
3. **Enhanced Personalization**: AI-powered systems can analyze user preferences and behaviors to deliver personalized experiences and recommendations.

Disadvantages:
1. **Job Displacement**: AI automation may lead to the displacement of human workers in certain industries, particularly those involving routine or repetitive tasks.
2. **Bias and Fairness Issues**: AI algorithms may exhibit biases inherited from the data they are trained on, leading to unfair or discriminatory outcomes.
3. **Privacy Concerns**: AI systems often rely on vast amounts of personal data to operate effectively, raising concerns about privacy and data security.

Q.(12) How is AI being used in our daily lives ? Write and explain any three uses.

Ans. :
AI has many applications in today's society. It is being utilised for a wide range of activities including medical diagnosis, remote sensing, finance, healthcare, education and transportation etc.
Siri ; it is popular personal assistant offered by Apple.
Netflix : It is a widely popular content on demand service, that uses predictive technology to offer recommendations on the basis of consumers reaction, interests, choices and behavior.
Smart home devices : AI is used in smart home devices to adjust the temperature and lighting based on our preferences.
Music and Media :
Smartphones :
Online services :
Visual search for buying products :
Fuzzy Logic :

Q.(13) Differentiate between an algorithm and Flowchart. (at least two differences)
Ans. :

Algorithm	Flowchart
It is a step by step solution of the problem.	It is also step by step solution to the problem but in the pictorial form.
In it, we use simple language like English.	In it, we use a special symbol like input, output, box etc.
It provides either to the computer or to a human being an unambiguous instruction to solve a problem.	It provides a better understanding of existing and prepared methods and procedures and systems.

Q.(14) Write at least two differences between Supervised and Unsupervised learning.
Ans. :
Presence of Labeled Data:

- **Supervised Learning:** In supervised learning, the algorithm is trained on a labeled dataset. This means that each training example is paired with the correct output (label). The model learns to map inputs (features) to the correct output based on this labeled data, and the goal is to predict the correct output for new, unseen inputs.
- **Unsupervised Learning:** In unsupervised learning, the algorithm is provided with unlabeled data, meaning the model does not have predefined labels or categories to learn from. The goal is to uncover hidden patterns, structures, or relationships within the data without prior knowledge of outcomes.

Key Difference: Supervised learning uses labeled data (with known outcomes), whereas unsupervised learning uses unlabeled data (with no predefined outcomes).
Type of Tasks or Problems Addressed:

- **Supervised Learning:** Supervised learning is typically used for classification and regression tasks. In classification, the model assigns labels to input data (e.g., predicting whether an email is spam or not), while in regression, the model predicts a continuous value (e.g., predicting house prices based on features like size, location, etc.).

- **Unsupervised Learning:** Unsupervised learning is primarily used for clustering, dimensionality reduction, and discovering underlying structures in data. Clustering groups data points into clusters based on similarity, while dimensionality reduction simplifies complex data by reducing the number of variables while retaining important information.

Q.(15) Write any four features of Python.
Ans. :

Easy to Learn and Use: Python has a simple and readable syntax, which makes it accessible for beginners. Its syntax closely resembles English, making it easier to understand and write code quickly.
Interpreted Language: Python is an interpreted language, meaning that code is executed line by line rather than being compiled into machine code first. This allows for faster testing and debugging.
Dynamically Typed: In Python, variable types are determined at runtime, not in advance. This means that you don't need to specify variable types explicitly, which simplifies the code and increases flexibility.
High-Level Language: Python abstracts many complex details of computer operations, such as memory management, allowing developers to focus more on solving problems than worrying about low-level programming details.
Extensive Standard Library: Python comes with a large standard library that includes modules for handling file I/O, regular expressions, web development, database interaction, and more, which speeds up development.
Object-Oriented: Python supports object-oriented programming (OOP) principles, such as inheritance, polymorphism, and encapsulation, allowing developers to organize and manage code in a more modular and reusable way.
Cross-Platform Compatibility: Python can run on various operating systems, such as Windows, macOS, and Linux, without requiring major modifications. This makes it a portable and versatile language for development.
Large and Active Community: Python has a vast and supportive community of developers who contribute to open-source libraries, frameworks, and tools. This makes finding solutions to problems, learning resources, and help much easier.

Q.(16) Define a string. Define an escape sequence used in Python. Give examples.
Ans. :
Definition of a String:
In Python, a **string** is a sequence of characters enclosed within either single quotes (' ') or double quotes (" "). Strings can represent text such as words, sentences, or even paragraphs.
Definition of an Escape Sequence:
An **escape sequence** in Python is a combination of characters that starts with a backslash (\) and represents special characters that would otherwise be difficult or impossible to type directly in a string. Escape sequences allow you to include characters such as newlines, tabs, quotes, etc., inside strings.
Common Escape Sequences in Python:

1. \n - **Newline**: Moves the cursor to the next line.
   Example:
   print("Hello\nWorld!")
   # Output:
   # Hello
   # World!
2. \t - **Tab**: Inserts a tab space.
   Example:
   print("Hello\tWorld!")
   # Output: Hello World!

Answer any 3 out of the given 5 questions on Subject Specific Skills. (3 x 4 = 12)

Q.(17) What is AI winters ? Differentiate between Narrow AI and General AI.
Ans. :
Mid 1970s to mid 1990s, computer scientists dealt with an acute shortage of funding for research on Artificial intelligence. These years were known as the AI Winters.
Narrow AI : It is designed to perform tasks that are more specific. It is also called weak AI. Eg. : Email spam filters, Netflix recommendations, Self driven vehicles, Google search
General AI : It includes the capability of understanding a vast scope of activities. It is also called strong AI.
Eg. : Chatbot that understands customer's needs and suggests solutions, a training system that functions without the help of a trainer

Q.(18) Explain spam filter. Name and explain any four applications of Artificial Intelligence.
Ans. :
Spam Filter:

A **spam filter** is a software or algorithm that identifies and blocks unsolicited, unwanted, or harmful email messages, commonly known as "spam." Spam filters use a variety of methods, such as keyword recognition, machine learning, and pattern analysis, to detect and segregate spam messages from legitimate emails. These filters can be customized to block messages based on specific criteria, such as certain words or the sender's email address. Modern spam filters are typically employed in email services to protect users from phishing attacks, malware, and cluttered inboxes.

Four Applications of Artificial Intelligence (AI):

Artificial Intelligence (AI) has a wide range of applications across different industries. Here are four significant ones:

1. **Healthcare**: AI is transforming healthcare by assisting in diagnosing diseases, predicting patient outcomes, and providing personalized treatment plans.
2. **Natural Language Processing (NLP)**: NLP, a subfield of AI, focuses on the interaction between computers and human languages.
3. **Autonomous Vehicles**: AI is at the heart of self-driving cars, enabling them to navigate, recognize objects, make decisions, and avoid obstacles without human intervention.
4. **Recommendation Systems**: AI-driven recommendation systems are widely used by companies to personalize user experiences.

Q.(19) Write an algorithm and draw flowchart to convert temperature from Celsius to Fahrenheit.
F = (9*C/5 + 32)
Ans. :
- **Start**
- **Input** the temperature in Celsius (C).
- **Compute** the temperature in Fahrenheit (F) using the formula: F=(9×C/5+32)F
- **Output** the value of Fahrenheit (F).
- **End**

Q.(20) Write programs in Python for the following :
(a) To input two numbers and display their sum and product
(b) To calculate simple interest by inputting the value of Principal amount, rate and time.

Ans. :

(a)
```
no1 = int(input("Enter first number ;"))
no2 = int(input("Enter second number ;"))
sum = no1 + no2
product = no1 * no2
print ("Addition of two numbers :", sum)
print ("Multiplication of two numbers :", product)
```

(b)
```
p = int(input("Enter principle :"))
r = int(input("Enter rate :"))
t = int(input("Enter time :"))
si = p*r*t/100
print ("Simple Interest :", si)
```

Q.(21) Write programs in Python for the following :

(a) To print table of a given number.

(b) Write a program using while loop that asks the user for a number, and prints a countdown from that number to zero.

Ans. :

(a)
```
number = int(input("Enter a number to print its table: "))
for i in range(1, 11):
result = number * i
print(number, " x", i " = ", result")
```

(b)
```
number = int(input("Enter a number : "))
while number >= 0:
    print (number)
    number = number -1
```

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