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 (417)

Class: IX   **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 21 questions in two sections: Section A & Section B.*
3. *Section A has Objective type questions 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 05 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 16 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

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

(i) Effective writing skill is the product of long hours of …………………. and practices.
    (a) Thinking   (b) Knowledge
    (c) Preparation   (d) None of the above

(ii) According to Dr. Albert Mehrabian, one of the pioneers in the field of body language, spoken words account for …………………. of what a listener perceives.
    (a) 7 per cent   (b) 38 per cent
    (c) 40 per cent   (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) None of the above   (d) All of the above

(iv) General feeling of self-worth is known as :
    (a) Self-confidence   **(b) Self-esteem**
    (c) Self-monitoring   (d) None of the above

(v) RAM is a part of :
    (a) Primary memory   (b) Secondary memory
    (c) Human memory   (d) None of the above

(vi) What kind of entity is an operating system ?
    (a) Hardware   **(b) Software**
    (c) Both (a) and (b)   (d) None of these

Q.(2) Answer any 5 questions out of the given 6 questions on Introduction to Artificial Intelligence. **(5 x 1 = 5)**

(i) The first "Intelligent" humanoid robot, built in Japan in 1972 was called
    (a) Shakey   (b) Sophia   **(c) WABOT-1**   (d) Roomba

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

(iii) The idea of "The Imitation Game" was proposed by
    (a) Rossum   **(b) Arthur Samuel**   (c) Alan Turing   (d) John McCarthy

(iv) The first industrial robot to work on a General Motors assembly line is
    (a) Roomba   (b) Eliza   **(c) Unimate**   (d) Kismet

(v) The first general purpose mobile robot, also called the "First electronic person" is
    (a) David   (b) ASIMO   (c) Unimate   **(d) Shakey**

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

Q.(3) Answer any 5 questions out of the given 6 questions on Applications and Future Trends of Artificial Intelligence. **(5 x 1 = 5)**

(i) A technology used in unmanned vehicles like self-driving cars and drones is called
    (a) Hybrid technology   **(b) Artificial Intelligence**
    (c) Space technology   (d) Solid state Intelligence

(ii) The first widely-used commercial form of Artificial Intelligence (AI) is being used in many popular products like microwave ovens, automobiles, washing machines etc. What is the name of this AI ?
    (a)Boolean Logic   **(b) Fuzzy Logic**
    (c) Human Logic   (d) Functional Logic

(iii) 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

(iv) Which company has launched "ECHO", an AI enabled product ?
    (a)Google   (b) Philips   **(c) Amazon**   (d) Samsung

(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) An AI enabled Robot is conducting a class instead of a human teacher. Which of the following is quite difficult for the robot to demonstrate ?
    (a) Lesson planning   (b) Getting attendance
    (c) Emotional Intelligence   (d) Dictating homework

Q.(4) Answer any 5 questions out of the given 6 questions on Artificial Intelligence Project Cycle. **(5 x 1 = 5)**

(i) Which of the following is not valid for Data Acquisition ?
    (a) Web Scraping   (b) Surveys   (c) Sensors   **(d) Announcements**

(ii) Which of the following comes under Problem Scoping ?
    (a) System Mapping   **(b) 4Ws Canvas**
    (c) Data Features   (d) Web Scraping

(iii) If an arrow goes from X to Y with a –(minus) sign, it means that
    (a) If X increases, Y decreases   (b) The direction of relation is opposite
    (c) If X increases, Y increases   (d) It is a bi-directional relationship

(iv) A ………………… shows the components and boundaries of a system and the components of the environment at a specific point in time.

(a) Choropleth Map
(b) System Map
(c) Concept Map
(d) Mind Map

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

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

(vi) Air pollution kills an estimated seven million people worldwide every year. WHO data shows that 9 out of 10 people breathe toxic air. For smog hanging over cities to smoke inside the home, air pollution poses a major threat to human health and climate. The major pollution sources include vehicles, power generation, agriculture waste incineration and industry. Harmful gases like SO_2, NO_2, CO are emitted directly into air because of pollution. Deploying an air quality index monitor is one way that would help to know the local air quality and take action to protect their health. Taking this as the problem, choose which of the following would be the ideal problem statement template.

(a) Our WHO have a problem that people breathe toxic air when smog hangs over cities. An ideal solution would be to shut down industries and stop the movement of vehicles in major cities.

(b) Our people have a problem that they die in accidents when more vehicles are used. An ideal solution would be to stop the movement of vehicles in major cities.

(c) **Our people have a problem that air pollution has damaging effects on human health when harmful gases like SO_2, NO_2, CO are emitted directly into air. An ideal solution would be to develop an air quality index monitor so that one can know the local air quality and take action to protect their health.**

(d) Our WHO have a problem that people die every year when there is an increase in the number of vehicles and industries. An ideal solution would be to make sure people stay indoors to protect their health.

Q.(5) Answer any 5 questions out of the given 6 questions on Program Design Aids.

(5 x 1 = 5)

(i) Which one of the following is a program planning tool ?

(a) Decision tree
(b) Flowchart
(c) Machine Learning
(d) Both (a) and (b)

(ii) Which of the following program planning tool allows the programmers to plan program logic by writing program instruction in an ordinary language ?

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

(iii) Which one of the following is not a characteristics of a good algorithm ?

(a) Finiteness
(b) Effectiveness
(c) Ambiguity
(d) Feasibility

(iv) 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

(v) Reema wants to know when can algorithms be used ?

(a) Only with computers
(b) Only when programming
(c) Only with flowcharts
(d) Any time to design solutions to problems

(vi) Ojas wants to know about flowchart. Which of the following is true about it ?

(a) Helps you plan out computer code
(b) It is a type of graphic diagram that represents an algorithm
(c) Uses shapes to help organize a process
(d) All of the above

SECTION B: SUBJECTIVE TYPE QUESTIONS

Answer any 3 out of the given 4 questions on Employability Skills (3 x 2 = 6)

Q. (6) What is communication ? Explain the various methods of communication.
Ans. : It is the act of transferring information from one person to another.
Verbal Communication : It involves the use of words. Its components which makes it more effective are language competency, vocabulary, general awareness, domain knowledge and listening.
Non-Verbal Communication : It involves gesture, postures and body movements. It is a method of using anything other than words for conveying information. Its components which makes it more effective are body language, proxemics, kinesics, haptics, vocalics, chromatics, chronemics and olfactics.
Visual/Graphic Communication : It includes pictures, illustrations and graphics. The creative minds that create visual images make use of colours, textures, contours and shapes that communicate not just message but also emotions, attitudes, experiences, lifestyles and concepts.

Q. (7) Explain any four factors (areas) building self-confidence of a person.
Ans. :
Locus of Control : It is the degree to which you perceive control over a situationbeing internal or external.
Self efficacy : It refers to a belief about your own ability to deal with events and challenges.
Self Esteem : It is your general feeling of self worth.
Self Monitoring : It is the extent to which you base your behaviour on cues from other peopleand situations.
Social factors : It is an individual is influenced by social interactions. Their relationship and interactions with family and social environment are important.
Cultural factors : Values, beliefs and customs followed in the family or a religious community directly influence building self confidence.
Physical factors : It means our physical looks/appearance, fitness, agility and ability. These directly influence building self confidence.

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 Primary and secondary memory of a computer system in detail.
Ans. :
(a) Primary Memory : It is electronic memory or main memory of the computer. These memories hold data only while the computer os ON. Its parts are RAM and ROM.
(b) Secondary Memory : It is magnetic memory or optical or flash but not electronic. It is used for long term storage of information. Eg. Hard disk, magnetic tape, magnetic disk, Flippy, CD
Answer any 4 out of the given 6 questions on Subject Specific Skills. (4 x 2 = 8)

Q.(10) What is AI winters ? Explain.
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.

Q.(11) Differentiate between Narrow AI and General AI.
Ans. :
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.(12) Explain Spam filter.
Ans. : It is a program that is used to detect unsolicited and unwanted email and prevent those messages from getting to a user's inbox.

Q.(13) What is Data visualisation ? Write and explain any two data visualisation techniques.
Ans. : It is the discipline of trying to understand data by placing it in a visual context so that patterns, trends and correlations that might not otherwise be detected can be exposed. It is the presentation of data in graphical format.
Techniques : Flowchart, Charts, System maps, Decision tree, Tree diagram etc.

Q.(14) Explain an algorithm using an example.
Ans. : An algorithm is an step by step method of solving a problem. It is commonly used for data processing, calculation and other related computer and mathematical operations.
Bake a cake :
Take the ingredients
Mix ingredients
Pour ingredients mixture in a pan
Put it in a oven
Bake until ready
If ready, remove
Let it cool
Serve

Q.(15) Draw flowchart and write an algorithm to find Area and Perimeter of Square.
Ans. :
Algorithm :
Start
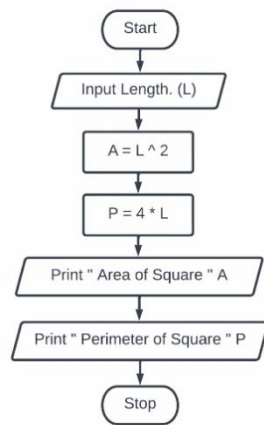Input length of side of square say L
Area = LxL
Perimeter = 4xL
Display Area, perimeter
Stop

Flowchart :

Answer any 4 out of the given 6 questions on Subject Specific Skills. (4 x 3 = 12)

Q.(16) Give any three 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.(17) Explain any three limitations of Artificial Intelligence.
Ans. :
Creative skills : AI will not be able to truly replicate a human's ability to create, invent and be inspiring.
Social skills : Machines are not great at interpersonal skills, being leaders aor participating in a brainstorm. AI will also find it hard to have intercultural sensitivity, which is fundamental for successful employeesof global companies.
Emotional Skills : AI technology is not close to being able to replicate empathy, adaptability and other emotional skills.

Q.(18) How is AI being used in our daily lives ? Write and explain any three uses of it.
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.(19) What is an Artificial Intelligent Project Cycle ? Explain all the steps involved in it.
Ans. : It is the sequence of phrases that a project goes through from its initiation to its closure.
Problem scoping : It includes scoping the problem which you wish to solve with the help of your project.
Data acquisition : It includes acquiring the data for the AI project.
Data Exploration : It includes exploring the data, interpreting some useful information out of the acquired data and put it uniformly for a better understanding of the data.
Modelling : It includes looking at different AI enabled algorithms, going through several models and select the ones which match your requirements and then implementing the chosen model.
Evaluation : It includes deploying the concerned model in the real world and evaluating each and every model and then cghoosing the model which gives the most efficient and reliable results.

Q.(20) Differentiate between an Algorithm and Flowchart. (Min. three points)
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.(21) Write three advantages and disadvantages each of using a flowchart.
Ans. :
Advantages :
It provides a visual representation which is easy to understand
It helps to clarify complex processes
It is an excellent way of communicating the logic of a program
Disadvantages :
Time consuming
Space consuming
Requires template or special software

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