

HOLIDAY HOMEWORK

Class IX Academic Year 2026–27

Subject: Artificial Intelligence

Student Name: _____	Roll No.: _____
Section: _____	

What is inside this homework?

- Section 1: Introduction to Artificial Intelligence
- Section 2: AI vs Not AI (Think & Decide Activity)
- Section 3: Smart Home Technology
- Section 4: Smart Cities
- Section 5: Domains of AI (Where AI is Used)
- Section 6: AI Ethics (Right and Wrong in AI)
- Section 7: Free AI Certificates (Step-by-Step Guide)

Important Instructions

1. Complete all sections neatly in this booklet or in a separate A4 (Ring File).
2. Section 7 (Certificates) — Attach printed/digital certificate copy with submission.
3. You may use the internet to research but write answers in your own words.
4. Be creative — diagrams, drawings, and colour are encouraged!



SECTION 1: Introduction to Artificial Intelligence

Before you begin: Read the concept box carefully, then complete the activities below.

Concept: What is Artificial Intelligence?

Artificial Intelligence (AI) is the ability of a computer or machine to perform tasks that normally require human intelligence — such as learning, reasoning, problem-solving, understanding language, and recognising patterns.

Key Terms to Know:

Algorithm — A set of step-by-step rules a computer follows to solve a problem.

Machine Learning — A type of AI where the computer learns from data (examples) without being directly programmed.

Neural Network — A system loosely inspired by the human brain, used to recognise patterns.

Natural Language Processing (NLP) — AI that helps computers understand and respond to human language (text or speech).

Computer Vision — AI that helps machines 'see' and understand images and videos.



Activity 1A: Fill in the Blanks

Use the key terms above (Algorithm, Machine Learning, NLP, Computer Vision, Neural Network) to complete the sentences.

1. When YouTube suggests the next video based on your watch history, it is using _____ to learn your preferences.
2. Google Translate uses _____ to understand and convert text from one language to another.
3. A self-driving car uses _____ to detect traffic lights, pedestrians, and other vehicles.
4. A recipe app follows a specific _____ to suggest dishes based on ingredients you enter.
5. The human brain inspired scientists to create a _____ to help AI recognise handwriting.



Activity 1B: In Your Own Words

Write a short definition of AI in your own words (3–4 sentences). Do NOT copy from the concept box — use your own understanding.

My Definition of AI:



Activity 1C: AI Timeline — Order These Events

The events below are jumbled up. Number them 1 to 6 in the order you think they happened (earliest = 1). Then write the correct year next to each after researching online.

Events: First chess-playing AI beat a world champion | First voice assistant (Siri) launched | The word 'Artificial Intelligence' was first used | GPT-4 released | IBM's Deep Blue defeats Garry Kasparov | AlphaGo beats world Go champion

Order	Event	Year (research)	My Order No.
	First chess-playing AI beat a world champion		
	First voice assistant (Siri) launched on iPhone		
	The word 'Artificial Intelligence' was first coined		
	GPT-4 released by OpenAI		
	IBM's Deep Blue defeats Garry Kasparov at chess		
	AlphaGo (DeepMind) beats world Go champion		



SECTION 2: AI vs Not AI — Think & Decide

How to Decide: Is it AI?

Ask yourself these 3 questions:

Q1. Does it learn from data or improve over time automatically?

Q2. Does it make decisions or predictions on its own?

Q3. Does it understand language, images, or patterns?

If YES to at least one — it likely involves AI. If NO to all — it is probably NOT AI.

Activity 2A: AI or Not AI — Fill the Table

For each example below, write 'AI' or 'Not AI' in the second column.

Then write a short reason (1 sentence) in the last column.

No.	Example	AI / Not AI	Why? (your reason)
1.	A simple calculator that adds two numbers		
2.	Spam filter in Gmail that learns to block junk mail		
3.	Google Maps suggesting a faster route based on live traffic		
4.	A digital wall clock showing time		
5.	Chatbot on a shopping website answering your questions		
6.	A regular electric fan controlled by a remote		
7.	Face recognition on your smartphone to unlock it		
8.	A printer that prints whatever document you send		
9.	Spotify creating a 'Discover Weekly' playlist for you		
10.	A smoke detector that beeps when it detects smoke		
11.	An AI doctor app that predicts diseases from symptoms		
12.	A television set with no internet connection		



SECTION 3: Smart Home Technology

What is a Smart Home?

A Smart Home uses AI and the Internet of Things (IoT) to automate and control devices like lights, fans, locks, cameras, and appliances — through a smartphone, voice commands, or automatic sensors. Smart homes save energy, improve security, and make daily routines easier.

Examples: Smart bulb (Philips Hue), Smart speaker (Amazon Echo / Google Nest), Smart AC (controlled via app), Smart doorbell with camera (Ring), Smart TV, Smart refrigerator that tracks food expiry.

Activity 3A: Smart Home Research Table

Research and fill in details for each smart home device below.

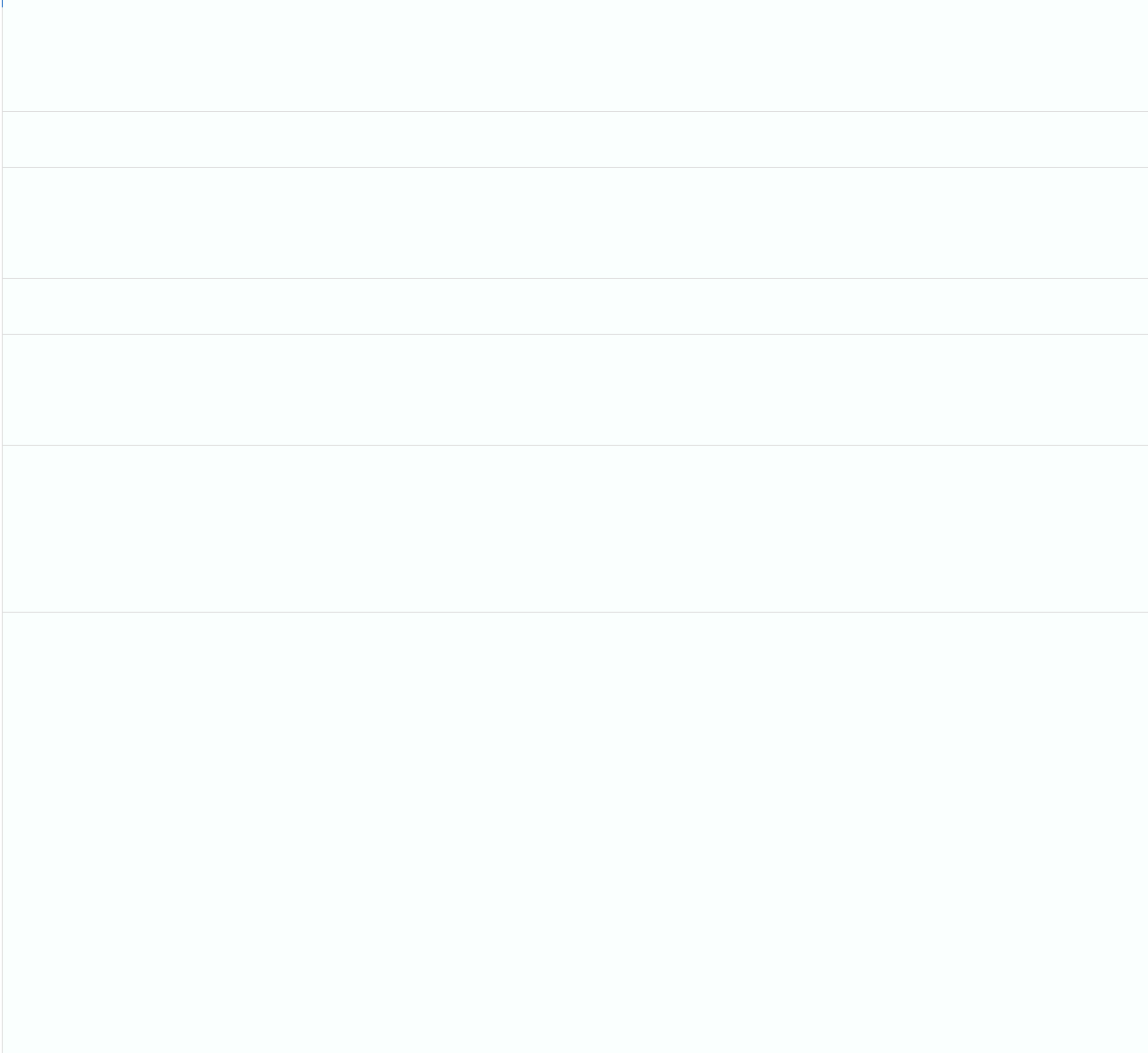
Find: one popular brand, one feature that uses AI, and the approximate price in India (in rupees).

Smart Device	Popular Brand	AI Feature it has	Approx. Price (₹)
Smart Speaker			₹
Smart Bulb			₹
Smart Doorbell Camera			₹
Smart Thermostat / AC			₹
Smart TV			₹
Smart Security Camera			₹

 **Activity 3B: Design Your Smart Room**

Draw your ideal SMART BEDROOM or SMART KITCHEN below.
Label at least 6 smart devices and write what AI task each device performs.
Use arrows or numbers to connect labels to devices in your drawing.

My Smart Room Drawing (Draw & Label below):





SECTION 4: Smart Cities — Technology for Better Living

What is a Smart City?

A Smart City uses digital technology, data, and AI to improve city services and quality of life. Smart cities collect data from sensors, cameras, and connected devices and use that information to manage traffic, save energy, reduce pollution, and deliver faster government services.

India's Smart Cities Mission (launched 2015) — 100 cities selected including Surat, Pune, Indore, Bhopal, Jaipur, Chandigarh, Lucknow, and many more.



Activity 4A: Smart City Features — Match & Explain

Column A shows a city problem. Column B shows a smart solution. Draw a line or write the letter to match them.

Then in the space below the table, explain HOW the matched solution actually works (in your own words, 2–3 sentences per pair).

No.	City Problem	Answer	Smart Solution (Column B)
1.	Traffic jams at every signal during peak hours		[A] AI-powered smart bins that send alerts when full — auto-schedules garbage truck routes
2.	Garbage bins overflowing before collection day		[B] Smart water meters detect leaks and send instant alerts to authorities via app
3.	Streetlights wasting electricity all night		[C] CCTV cameras with AI facial recognition monitor public spaces 24/7
4.	Water pipe leaks going unnoticed for weeks		[D] Adaptive traffic signal system uses sensors to detect vehicle count and adjusts green light timing
5.	Crime in poorly lit areas		[E] Solar-powered LED smart lights with motion sensors — turn bright only when someone is nearby



SECTION 5: Domains of AI — Where is AI Used?

AI Domains are the different areas or fields where AI is applied. Each domain uses specific AI techniques to solve that field's problems.

Main AI Domains: Healthcare | Agriculture | Education | Finance | Transport | Entertainment | Environment | Manufacturing | Defence | Retail

Activity 5A: Domain Exploration Table

A real-world AI example is given for each domain. Research and find ONE more example for each domain — write it in the last column.

Your example must be different from the one given.

AI Domain	Real-World Example	Find ONE more example (your research)
Healthcare	AI reads X-rays and MRI scans to detect tumours (e.g., Google Health AI)	
Agriculture	AI drones monitor crops and detect pest attacks early (e.g., Cropping)	
Education	AI tutors personalise lessons for each student (e.g., Khan Academy AI)	
Finance / Banking	AI detects fraudulent credit card transactions in real time	
Transport	Self-driving cars use AI to navigate roads (e.g., Waymo, Tesla Autopilot)	
Entertainment	AI recommends movies/songs based on your taste (Netflix, Spotify)	
Environment	AI tracks deforestation using satellite imagery (e.g., Global Forest Watch)	
Manufacturing	AI robots assemble car parts with precision on factory lines	
Retail / Shopping	AI chatbots assist shoppers and manage inventory automatically	
Defence / Security	AI surveillance systems detect unusual activities in sensitive areas	



SECTION 6: AI Ethics — Right and Wrong in Artificial Intelligence

What is AI Ethics?

AI Ethics is a set of moral principles and guidelines that ensure AI is designed and used in a way that is fair, safe, transparent, and beneficial to humans. As AI becomes more powerful, it is important to ask: Is this AI fair? Is it safe? Who is responsible if it goes wrong?

5 Core Principles of AI Ethics:

1. Fairness — AI must not discriminate based on gender, race, religion, or background.
2. Transparency — AI systems must be explainable; people should know how decisions are made.
3. Privacy — AI must not misuse personal data without consent.
4. Accountability — Someone must be responsible when AI makes a mistake or causes harm.
5. Safety — AI must not be used to harm people, manipulate behaviour, or create dangerous situations.



Activity 6A: Ethical or Not? — Case Study Analysis

Read each scenario. Identify which AI Ethics principle is being violated (Fairness / Transparency / Privacy / Accountability / Safety).

Then write what you think should be done differently.

Case 1: A recruitment AI rejects all female applicants for engineering jobs because the training data was mostly male engineers.

Principle Violated: _____ | What should change:

Case 2: A social media AI shows you only content that makes you angry — because angry people spend more time online and see more ads.

Principle Violated: _____ | What should change:

Case 3: A hospital's AI diagnostic tool gives wrong diagnoses, but no one knows why — not even its creators.

Principle Violated: _____ | What should change:

Case 4: A fitness app secretly sells your health data (weight, heart rate) to insurance companies without telling you.

Principle Violated: _____ | What should change:

Case 5: A self-driving car's AI injures a pedestrian. The company says 'it was the AI's fault' and refuses to compensate.

Principle Violated: _____ | What should change:



SECTION 7: Free AI Certificates — Complete & Attach

Instructions for this Section:

AI for Oceans certificate is mandatory. Complete at least TWO more certificates from the list below. You may complete more for extra credit.

After completing each course, download/screenshot your certificate and attach it with your homework submission.

What you need: A smartphone or laptop, a free email ID (your own or parent's), and internet connection.

All courses below are 100% FREE and designed for beginners — no prior tech knowledge needed.

No.	Certificate / Course Name	Website Link	Topics Covered
1	AI for Oceans by Code.org FREE No sign-in needed	code.org/oceans	Training data, Machine Learning, AI bias
2	Teachable Machine by Google FREE No account needed Browser only	teachablemachine.withgoogle.com	Train your own AI model using webcam images/sounds
3	AI Fundamentals (AI-900 Prep) by Microsoft Learn FREE Badge + Certificate issued	learn.microsoft.com (search: AI Fundamentals)	Intro to AI, ML, Computer Vision, NLP, Conversational AI
4	Intel AI for Youth by Intel / CBSE FREE School registration may be needed	intel.com (search: AI for Youth)	AI basics, ML concepts, AI project cycle, societal impact
6	Elements of AI by University of Helsinki & MinnaLearn FREE Certificate on completion	elementsofai.com	What is AI, problem solving, ML, neural networks, implications

Certificate Submission Checklist

Tick each item before submitting your homework:

- Completed at least 2 certificates from the list above
- Printed OR screenshot of Certificate 1 attached
- Printed OR screenshot of Certificate 2 attached
- If Certificate 3 (Teachable Machine): screenshot + 5-line paragraph attached
- All Sections 1–6 answered in this booklet
- Name and Roll No. written on the cover page

Well done, Future AI Innovator!

The future belongs to those who learn how to learn.

Enjoy your holidays — stay curious, keep exploring!

