CENTRAL BOARD OF SECONDARY EDUCATION

CBSE 2026-27

Artificial Intelligence

Subject Code: 417 | Class X

Question Bank – Set 3

Questions in this Booklet

Ch.	Chapter	MCQs	A-R	VSA	SA	LA	CS	All
1	Communication Skills – II	9	0	3	5	0	0	**17**
2	Self-Management Skills – II	9	0	3	5	0	0	**17**
3	Information and Communication Technology Skills – II	9	0	3	5	0	0	**17**
4	Entrepreneurial Skills – II	9	0	3	5	0	0	**17**
5	Green Skills – II	9	0	3	5	0	0	**17**
6	Revisiting AI Project Cycle & Ethical Frameworks for AI	12	3	4	5	2	2	**28**
7	Advanced Concepts of Modeling in AI	12	3	4	5	2	2	**28**
8	Evaluating Models	12	3	4	5	2	2	**28**
9	Computer Vision	12	3	4	5	2	2	**28**
10	Natural Language Processing	12	3	4	5	2	2	**28**
	Total	**105**	**15**	**35**	**50**	**10**	**10**	**225**

MCQs = Multiple Choice; A-R = Assertion–Reason; VSA = Very Short Answer; SA = Short Answer; LA = Long Answer; CS = Case Study / Source-based.

About this booklet: Chapters 1–5 = Part A Employability Skills; Chapters 6–10 = Part B Subject Specific Skills (theory-assessed units). Units 4 (Statistical Data) and 7 (Advance Python) are assessed through practicals only and are therefore not included. Marks: MCQ/A-R/VSA = 1, SA = 2, LA = 4, Case Study = 4. Questions tagged in grey come from CBSE Sample Papers / Board papers; the others are CBSE-pattern practice questions.

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1. Communication Skills – II

Part A, Unit 1

Multiple Choice Questions (MCQs)

Q1. Which of these is descriptive, specific feedback? **[1]**
(a) Good job.
(b) Your work is nice.
(c) Your presentation kept the audience engaged because you used clear examples.
(d) You are always careless.

Q2. Which of these is non-specific feedback? **[1]**
(a) You missed two steps in the lab procedure.
(b) Your work is nice.
(c) Your sentences were well structured.
(d) You wrote 40 words in the answer.

Q3. A group of related words without both a subject and a predicate is called a: **[1]**
(a) Clause (b) Phrase (c) Sentence (d) Paragraph

Q4. A message that leaves out important facts, such as the deadline and venue, lacks which 'C'? **[1]**
(a) Concise (b) Coherent (c) Correct (d) Complete

Q5. Which type of communication takes place when the number of people is small enough to communicate with each other effectively? **[1]**

[Board 2025]

(a) Interpersonal communication
(b) Public communication
(c) Intrapersonal communication
(d) Small group communication

Q6. The message 'Send the report as soon as possible' gives no date or format. Which 'C' is missing? **[1]**
(a) Concrete (b) Courteous (c) Coherent (d) Concise

Q7. Which sentence is imperative? **[1]**
(a) The report is ready.
(b) Submit the report by Friday.
(c) Did you submit the report?
(d) What a fine report!

Q8. Identify the imperative sentence. **[1]**

[Board 2026]

(a) Shut the front door.
(b) She is a talented artist.
(c) Are you feeling better?
(d) You were amazing!

Q9. Which sentence is interrogative? **[1]**
(a) I am going home. (b) Close the door. (c) Where do you live? (d) What a lovely day!

Very Short Answer (VSA)

Q10. True or False: Gestures and facial expressions are examples of visual communication. **[1]**

Q11. Words such as 'and', 'but' and 'or' that join words or sentences are called _____. **[1]**

Q12. Communication that uses words, spoken or written, is called _____ communication. **[1]**

Short Answer (SA)

Q13. Differentiate between specific and non-specific feedback with one example of each. **[2]**

Q14. List two best practices for effective communication. **[2]**

[SQP 2023-24; SQP 2024-25]

Q15. Name the four main categories of communication styles. **[2]**

[SQP 2020-21; MS 2020-21]

Q16. Identify the noun and the adverb in the sentence: 'The students happily submitted their projects.' **[2]**

Q17. Explain any two physical barriers to communication. **[2]**

2. Self-Management Skills – II

Part A, Unit 2

Multiple Choice Questions (MCQs)

Q1. Which of these causes stress? **[1]**

(a) Regular sleep (b) Healthy food
(c) Physical exercise (d) Being unable to meet high expectations

Q2. Breaking down big goals into smaller parts will make the goal _____. **[1]**

[Board 2026]

(a) specific (b) measurable (c) realistic (d) achievable

Q3. Which habit can increase stress? **[1]**

(a) Procrastination (b) Regular exercise (c) Sound sleep (d) Yoga

Q4. Which is NOT a benefit of working independently? **[1]**

(a) Better decision-making (b) Dependence on others
(c) Self-confidence (d) Self-reliance

Q5. Controlling impulsive reactions and staying calm during a disagreement shows: **[1]**

(a) Stress denial (b) Self-regulation (c) Dependence (d) Impulsiveness

Q6. Which statement about stress is correct? **[1]**

(a) Stress is always beneficial
(b) Stress arises when demands exceed a person's ability to cope
(c) Stress can be avoided only by working more
(d) Stress does not affect health

Q7. Tracking progress towards goals regularly helps a person to: **[1]**

(a) Abandon goals (b) Ignore deadlines
(c) Stay on course and adjust plans (d) Avoid planning

Q8. Which is a sign of poor time management? **[1]**

(a) Making a to-do list (b) Missing deadlines
(c) Prioritising tasks (d) Tracking progress

Q9. Which technique calms the mind and improves focus by controlling breathing and attention? **[1]**

(a) Meditation (b) Overeating
(c) Skipping sleep (d) Working late every night

Very Short Answer (VSA)

Q10. True or False: Working independently means waiting for instructions at every step. **[1]**

Q11. The four steps of effective time management are Organise, Prioritise, Control and _____. **[1]**

Q12. Taking ownership of one's actions and their outcomes is called _____. **[1]**

Short Answer (SA)

Q13. List four steps to build self-motivation. **[2]**

[SQP 2025-26; MS 2025-26]

Q14. Explain self-awareness with an example of how it helps in daily life. **[2]**

Q15. Explain how emotional intelligence helps in workplace relationships. **[2]**

Q16. What is the importance of setting goals in life? **[2]**

[SQP 2023-24]

Q17. What is the importance of time management in effectively dealing with stress? Provide any one strategy for improving time management skills to reduce stress. **[2]**

[Board 2024]

3. Information and Communication Technology Skills – II

Part A, Unit 3

Multiple Choice Questions (MCQs)

Q1. Which software starts working as soon as a computer is switched on and displays the desktop? **[1]**

(a) Operating system (b) Web browser (c) Antivirus (d) Word processor

Q2. Which practice helps protect a computer against viruses? **[1]**

(a) Installing anti-virus software and a firewall
(b) Opening all unknown attachments
(c) Disabling updates
(d) Sharing passwords

Q3. Which of these is NOT a good data-protection practice? **[1]**

(a) Installing anti-virus (b) Using 'password' as the password
(c) Using a firewall (d) Backing up data

Q4. Which is the recommended way to protect data from unauthorised users? **[1]**

(a) Share passwords on unsecure sites (b) Leave the computer unlocked
(c) Use a password like 1234 (d) Use strong passwords with mixed characters

Q5. Renaming a file means: **[1]**

(a) Deleting its content (b) Changing its size
(c) Changing its name (d) Changing its format

Q6. Which operation moves a file to another location without creating a duplicate? **[1]**

(a) Copy (b) Move (c) Backup (d) Save

Q7. Which task belongs to monthly maintenance? **[1]**

(a) Cleaning the keyboard (b) Cleaning the e-mail inbox
(c) Backing up data weekly (d) Running disk-cleaner software

Q8. Which action creates a new folder on the desktop? **[1]**

(a) Run a virus scan (b) Right-click, select New and then Folder
(c) Clean the keyboard (d) Install an anti-virus

Q9. What is the recommended action for SPAM e-mails? **[1]**

(a) Respond to them (b) Forward them to friends
(c) Never respond and delete them regularly (d) Click their links

Very Short Answer (VSA)

Q10. A group of related files is stored in a _____. **[1]**

Q11. A _____ is a virus that replicates itself and spreads to all files. **[1]**

Q12. Copying a file creates a _____ of the file in another location. **[1]**

Short Answer (SA)

Q13. 'Security break is leakage of information stored in a computer.' Explain two ways in which personal information can be lost or leaked. **[2]**

[SQP 2025-26; MS 2025-26]

Q14. List any two tasks in a weekly maintenance schedule. **[2]**

Q15. What are antivirus? Name any 2 antiviruses. **[2]**

[SQP 2020-21; MS 2020-21]

Q16. Explain the meaning of 'backing up data' and name one device used for a backup. **[2]**

Q17. Describe the steps to create a new folder on the desktop. **[2]**

4. Entrepreneurial Skills – II

Part A, Unit 4

Multiple Choice Questions (MCQs)

Q1. Which of these is a myth about entrepreneurship? **[1]**
(a) Entrepreneurs make decisions about production
(b) Entrepreneurs take calculated risks
(c) Every business idea needs to be unique or special
(d) Entrepreneurs manage raw materials

Q2. An entrepreneur plans the future of the business, arranges raw materials, hires people and checks whether the plan is followed. Which function is this? **[1]**
(a) Taking risks (b) Dividing income
(c) Making decisions (d) Managing the business

Q3. Which statement best explains why 'every business idea must be unique' is a misconception? **[1]**
(a) Only unique ideas can earn profit
(b) Entrepreneurs never copy anyone
(c) A person can take an existing idea and do something different with it
(d) Unique ideas are illegal to sell

Q4. Which of the following is a quality of successful entrepreneurs? **[1]**

[Board 2024]

(a) Resistance to change (b) Lazy
(c) Less-confident (d) Hard working

Q5. Which statement shows how entrepreneurs help a locality grow? **[1]**
(a) When people buy and sell, everyone involved makes money
(b) Shops are forced to close
(c) Trade stops completely
(d) Money is kept hidden at home

Q6. Which of the following is a common misconception about entrepreneurship? **[1]**

[Board 2025 Comptt]

(a) Entrepreneurs are not always successful on their first attempt.
(b) Starting a business requires a large amount of initial capital.
(c) It is not required to have extensive industry experience to become an entrepreneur.
(d) Entrepreneurs may need to collaborate with others.

Q7. Reema has started her own restaurant. She keeps on trying new ideas to make different dishes for her customers. As an entrepreneur, Reema is: **[1]**

[Board 2025]

(a) Creative (b) Impatient (c) Under-confident (d) Lazy

Q8. Ramu sits at his plant shop and sells to customers who walk in. Ramya walks around to bring in customers, sells seeds and flowers along with her plants, and keeps adding new ideas to grow her business. Which statement is correct? **[1]**
(a) Ramu is an entrepreneur and Ramya is a businessman
(b) Both Ramu and Ramya are wage-employed
(c) Both Ramu and Ramya are consumers
(d) Ramya is an entrepreneur and Ramu is a businessman

Q9. Which of these is NOT a quality of a successful entrepreneur? **[1]**
(a) Giving up when facing problems (b) Confidence
(c) Creativity (d) Hard work

Very Short Answer (VSA)

Q10. Name the function in which an entrepreneur arranges raw materials, hires people and checks that the plan is followed. **[1]**

Q11. True or False: In the Survive stage, an entrepreneur has to remain in a competitive market. **[1]**

Q12. A person who starts a business to satisfy a need is a _____ employed person. **[1]**

Short Answer (SA)

Q13. Why is a self-employed person not automatically an entrepreneur? Explain. **[2]**

Q14. Write any four common functions of an entrepreneur. **[2]**

[Board 2022]

Q15. How does an entrepreneur's decision about what to produce affect the business? Explain in 20-30 words. **[2]**

Q16. Explain how an entrepreneur can make a common business different from others. **[2]**

Q17. Explain the 'Enter' stage of an entrepreneur's career process with an example. **[2]**

5. Green Skills – II

Part A, Unit 5

Multiple Choice Questions (MCQs)

Q1. Sustainable development is best described as development that: **[1]**
(a) Maximises profit now
(b) Meets present needs without harming future generations
(c) Stops all industry
(d) Uses only chemicals

Q2. Environmental degradation is caused mainly by: **[1]**
(a) Human activities such as cutting trees and pollution
(b) Rain
(c) Sunshine
(d) Growth of plants

Q3. Excessive use of chemical fertilisers mainly causes: **[1]**
(a) Depletion of soil nutrients (b) More fertile land forever
(c) Clean water (d) Better soil for future generations

Q4. Which of these is NOT a sustainable practice? **[1]**
(a) Rainwater harvesting (b) Vermicomposting
(c) Drip irrigation (d) Deforestation

Q5. Which SDG is 'Industry, Innovation and Infrastructure'? **[1]**
(a) SDG 11 (b) SDG 14 (c) SDG 16 (d) SDG 9

Q6. Which SDG is related to 'Life on Land'? **[1]**
(a) SDG 14 (b) SDG 11 (c) SDG 15 (d) SDG 17

Q7. Which is the core skill needed by a person who wants to contribute to the environment? **[1]**
(a) Excessive shopping (b) Environmental awareness
(c) Burning waste (d) Noise making

Q8. Which is a basic step to protect the environment at home? **[1]**
(a) Dumping garbage in ponds
(b) Burning plastic
(c) Overusing water
(d) Segregating waste into biodegradable and non-biodegradable

Q9. Which SDG is 'Decent Work and Economic Growth'? **[1]**
(a) SDG 12 (b) SDG 8 (c) SDG 3 (d) SDG 13

Very Short Answer (VSA)

Q10. The SDG for 'Clean Water and Sanitation' is SDG number _____. **[1]**

Q11. Name the type of pollution caused by industrial smoke and vehicle emissions. **[1]**

Q12. True or False: Rainwater harvesting helps conserve water for future use. **[1]**

Short Answer (SA)

Q13. Name any four man-made disruptions that cause ecological imbalance. **[2]**

[SQP 2020-21; MS 2020-21]

Q14. Give any two examples of how individual choices and behaviours can contribute in achieving sustainable development. **[2]**

[Board 2024]

Q15. State two ways to reduce plastic use in daily life. **[2]**

Q16. Define sustainable development. Write any two problems related to sustainable development. **[2]**

[Board 2025 Comptt]

Q17. State two benefits of using solar energy. **[2]**

6. Revisiting AI Project Cycle & Ethical Frameworks for AI

Part B, Unit 1

Multiple Choice Questions (MCQs)

Q1. With respect to the type of data fed into an AI model, AI models can be broadly categorised into how many domains? **[1]**

(a) Two (b) Four (c) Three (d) Five

Q2. As AI is essentially being used as a decision-making / influencing tool, we need to ensure that AI makes morally acceptable recommendations. Which of the following is a key factor that can knowingly or unknowingly influence our decision-making while designing an AI model? **[1]**

[Board 2026]

(a) Algorithm efficiency (b) Data storage capacity
(c) Processing speed (d) Intuition and Values

Q3. What do frameworks provide in the context of problem-solving? **[1]**

[SQP 2025-26; MS 2025-26]

(a) Random solutions (b) Legal advice
(c) Step-by-step guidance (d) Hardware designs

Q4. A team gives its large collected dataset a visual representation using graphs, databases, flow charts and maps. Which stage of the AI Project Cycle is it performing? **[1]**

(a) Problem Scoping (b) Data Acquisition (c) Modelling (d) Data Exploration

Q5. Which value-based framework asks whether the actions of individuals or organisations align with principles such as honesty, compassion and integrity? **[1]**

(a) Utility-based framework (b) Rights-based framework
(c) Sector-based framework (d) Virtue-based framework

Q6. The bioethics principle of 'beneficence' focuses on: **[1]**

(a) Respecting the decisions of users
(b) Avoiding all harm at any cost
(c) Promoting and maximising the well-being of individuals and society
(d) Hiding model data from patients

Q7. The purpose of the My Goodness activity is to: **[1]**

(a) Teach Python programming
(b) Compare prices of products
(c) Understand how our decisions get influenced by our personal morals, values and ethics
(d) Build a confusion matrix

Q8. Besides giving a step-by-step approach, frameworks also serve as: **[1]**

(a) A common language for communication and collaboration
(b) A replacement for data
(c) A type of hardware
(d) A programming language

Q9. Which of the following is an example of the Statistical Data domain of AI? **[1]**

(a) Face filters on social media (b) Voice assistants
(c) Email filters (d) Price comparison websites

Q10. When we talk about a machine, it is artificial and cannot think on its own. Any bias in an AI system comes from: **[1]**

(a) The machine itself
(b) The developer or the data, transferring to the machine while the algorithm is developed
(c) The electricity supply
(d) The user interface colours

Q11. When developing AI, weighing the potential benefits of an application against risks such as job displacement or privacy concerns follows the: **[1]**

(a) Virtue-based framework
(b) Rights-based framework
(c) Utility-based framework
(d) Bioethics framework

Q12. An AI hiring algorithm was biased against women applicants. Which need of AI does this incident highlight? **[1]**

(a) The need for faster processors
(b) The need for ethical frameworks so that AI makes morally acceptable choices
(c) The need for more storage
(d) The need for colourful interfaces

Assertion–Reason

Q13. **Assertion (A):** Under the principle of justice, the benefits and burdens of a choice must be distributed across people irrespective of their background.
Reason (R): The solution must be aware of social structures and determinants that result in biases like racism and sexism. **[1]**

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true, but Reason (R) is false.
(d) Assertion (A) is false, but Reason (R) is true.

Q14. **Assertion (A):** Problem Scoping is the first stage of the AI project cycle.
Reason (R): In this stage, we set the goal of the project by stating the problem we wish to solve. **[1]**

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true, but Reason (R) is false.
(d) Assertion (A) is false, but Reason (R) is true.

Q15. **Assertion (A):** Data Exploration gives the acquired data a visual representation.
Reason (R): A confusion matrix is drawn during Data Exploration. **[1]**

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true, but Reason (R) is false.
(d) Assertion (A) is false, but Reason (R) is true.

Very Short Answer (VSA)

Q16. The first stage of the AI Project Cycle is _____. **[1]**

Q17. The three categories of value-based frameworks are rights-based, utility-based and _____-based. **[1]**

Q18. A _____ is a set of steps that help us in solving problems in an organised manner. **[1]**

Q19. Name the value-based framework that aims for the greatest benefit of the greatest number of people. **[1]**

Short Answer (SA)

Q20. Define an ethical framework for AI. Why does AI need such frameworks? **[2]**

Q21. What is the purpose of the My Goodness activity? Name any two factors which could influence your decisions

in it without you realising. **[2]**

Q22. Suhana works for a company and was assigned the task of developing a project using the AI project cycle. She knew that the first stage was scoping the problem. List the remaining stages that she must go through to develop the project. **[2]**

[SQP 2022-23; MS 2022-23]

Q23. Differentiate between non-maleficence and beneficence as principles of bioethics. **[2]**

Q24. List any two factors which knowingly or unknowingly influence our decision-making while designing an AI model, and explain one of them. **[2]**

Long Answer (LA)

Q25. What is the significance of the AI project cycle? Also explain how Data Acquisition is different from Data Exploration. **[4]**

[Board 2023 (adapted)]

Q26. Explain the three value-based ethical frameworks, giving one AI-related example of each. **[4]**

Case Study

Case Study: A hospital uses an AI tool to identify patients at high risk so that extra care resources can be directed to those who need them most. The tool was trained on healthcare expense data as a measure of illness. Because less money had historically been spent on patients from one community, the tool marked genuinely sicker patients of that community as low risk, so they received less care than equally ill patients from other communities.

Q27. Answer the following questions based on the case above. **[4]**

(i) How does the 'respect for autonomy' principle apply to this tool? Give two measures. [2]

(ii) How would 'do not harm' and 'justice' have changed the outcome for the community's patients? [2]

Case Study: A multinational company is facing scrutiny over its environmental practices, particularly regarding the disposal of industrial waste. The company has historically prioritized profit maximization and cost-cutting measures, leading to practices that result in environmental harm and negative impacts on local communities. Stakeholders, including investors, customers, and advocacy groups, are calling for the company to adopt more responsible and sustainable business practices.

Q28. Answer the following questions based on the case above. **[4]**

(i) Which type of ethical framework (sector-based or value-based) is the question of the company's practices being judged through? Justify. [2]

(ii) Analyse the company's actions using any two value-based frameworks. [2]

7. Advanced Concepts of Modeling in AI

Part B, Unit 2

Multiple Choice Questions (MCQs)

Q1. In a neural network, what is the function of the input layer? **[1]**

[Board 2025 Comptt]

(a) It receives and passes the raw input data to the hidden layers.
(b) It performs mathematical operations on the input data.
(c) It connects neurons to the output layer for predictions.
(d) It stores weights and biases for neural network training.

Q2. Which learning approach would be most suitable for training an AI model to park a car correctly? **[1]**

[Board 2026]

(a) Supervised Learning
(b) Reinforcement Learning
(c) Unsupervised Learning
(d) Transfer Learning

Q3. The output of a classification model is: **[1]**

(a) A discrete category or class label
(b) A continuous number
(c) A list of weights
(d) A rule book

Q4. In a neural network, a weight represents: **[1]**

(a) The number of layers
(b) The strength or importance of a connection between two nodes
(c) The number of instances
(d) The label of a data point

Q5. A fitness tracker learns your normal heart rate and flags a sudden, unusual spike. This application is called: **[1]**

(a) Speech recognition
(b) Anomaly detection
(c) Machine translation
(d) Image segmentation

Q6. A perceptron has inputs x1 = 1, x2 = 1 and x3 = 0, weights w1 = 0.2, w2 = 0.3 and w3 = 0.4, and bias b = 0.1. What is y = w1x1 + w2x2 + w3x3 + (1 $\times$ b)? **[1]**

(a) 0.4 (b) 0.5 (c) 0.6 (d) 0.9

Q7. Finding items that are often bought together (market basket analysis) is an example of: **[1]**

(a) Association (unsupervised learning)
(b) Regression (supervised learning)
(c) Reinforcement learning
(d) Rule-based approach

Q8. In the Human Neural Network game, how many students form the input layer in the given game structure? **[1]**

(a) 6 (b) 7 (c) 12 (d) 20

Q9. A perceptron has inputs x1 = 1 and x2 = 0, weights w1 = 0.5 and w2 = 0.4, and bias b = 0.2. What is y = w1x1 + w2x2 + (1 $\times$ b)? **[1]**

(a) 0.5 (b) 0.7 (c) 0.9 (d) 0.4

Q10. _____ enables computers to mimic human intelligence. **[1]**

[Board 2025 Comptt]

(a) Cloud Computing
(b) Web Development
(c) Data Entry
(d) Artificial Intelligence

Q11. The output layer of a neural network: **[1]**

(a) Gives the final output to the user
(b) Receives raw data from the user
(c) Hides the computation from the programmer
(d) Stores the training data

Q12. After the weighted sum is computed in a perceptron, the result is compared with: **[1]**

(a) A threshold value to produce the output
(b) The number of hidden layers
(c) The testing dataset
(d) A list of rules

Assertion–Reason

Q13. **Assertion (A):** Unsupervised learning requires labelled data to find patterns.
Reason (R): Unsupervised learning works on unlabelled data. **[1]**
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true, but Reason (R) is false.
(d) Assertion (A) is false, but Reason (R) is true.

Q14. **Assertion (A):** Reinforcement learning uses rewards and penalties to learn.
Reason (R): Reinforcement learning needs a fully labelled dataset before it can start. **[1]**
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true, but Reason (R) is false.
(d) Assertion (A) is false, but Reason (R) is true.

Q15. **Assertion (A):** Artificial intelligence is the umbrella term that covers both machine learning and deep learning.
Reason (R): Machine learning and deep learning both use data. **[1]**
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true, but Reason (R) is false.
(d) Assertion (A) is false, but Reason (R) is true.

Very Short Answer (VSA)

Q16. In a neural network node, the _____ is an extra value added to the weighted sum to shift the output. **[1]**

Q17. Expand the term ANN. **[1]**

Q18. State True or False: Clustering is a supervised learning technique. **[1]**

Q19. The _____ layer of a neural network gives the final result to the user. **[1]**

Short Answer (SA)

Q20. What are weights and biases in a neural network? **[2]**

Q21. Give two differences between supervised and unsupervised learning. **[2]**

[Board 2026]

Q22. Define reinforcement learning with one example. **[2]**

Q23. How can a neural network extract features automatically? **[2]**

Q24. Explain labelled data and unlabelled data with one example each. **[2]**

Long Answer (LA)

Q25. A system of organised machine learning algorithms is shown as follows. Data is fed to a first column of identical nodes, each node applies a machine learning algorithm with hidden rules, the result passes through a second column of identical nodes, and finally an Answer is produced as output. (a) Identify the concept. (b) Explain its working. **[4]**

[Board 2025 (diagram described in words)]

Q26. **[4]**

[SQP 2025-26]

(a) What is the name of the learning model that works with unlabelled data to identify hidden patterns or structures in the data? [1]

(b) Name the two main categories of this learning model. [1]

(c) Explain each category briefly and provide one example for each. [2]

Case Study

Case Study: In a classroom run of the Human Neural Network game, 7 students stand as the input layer, 6 as hidden layer 1, 6 as hidden layer 2 and 1 as the output layer.

Q27. Answer the following questions based on the case above. **[4]**

(i) How many students take part in total? [1]

(ii) Which group receives the image that is shown? [1]

(iii) What does each hidden-layer student do? [1]

(iv) What is the role of the output layer? [1]

Case Study: An AI team records whether a fan was switched on, based on the readings below.

Day	Outside temperature (°C)	Humidity (%)	Fan on?
1	34	60	Yes
2	22	80	No
3	30	55	Yes
4	18	70	No

Q28. Answer the following questions based on the case above. **[4]**

(i) How many instances (records) are in the table? [1]

(ii) Name the label and the features in this dataset. [1]

(iii) Which learning type is used if the model is trained on these labelled records? [1]

(iv) Name the model type if the system predicts only Yes or No. [1]

8. Evaluating Models

Part B, Unit 3

Multiple Choice Questions (MCQs)

Q1. _____ is one of the parameters for evaluating a model's performance and is defined as the fraction of positive cases that are correctly identified. **[1]**

[Board 2024]

(a) Precision (b) Accuracy (c) Recall (d) F1

Q2. Which metric should be given more importance when missing an actual disease case is very costly? **[1]**

(a) Recall (b) Precision
(c) Error rate on training data (d) Training accuracy

Q3. A model has TP = 30, TN = 50, FP = 10 and FN = 10 for 100 cases. What is its accuracy? **[1]**

(a) 0.80 (b) 0.60 (c) 0.70 (d) 0.90

Q4. While evaluating a model's performance, the recall parameter considers: (i) False positive (ii) True positive (iii) False negative (iv) True negative. Choose the correct option. **[1]**

[Board 2023]

(a) Only (ii) (b) (i) and (iv)
(c) (ii) and (iii) (d) (i), (iii) and (iv)

Q5. A model made 850 correct predictions out of 1000 predictions. Its accuracy is: **[1]**

(a) 0.15 (b) 0.85 (c) 0.75 (d) 0.885

Q6. Which of the following talks about how true the predictions are made by any model? **[1]**

[Board 2023]

(a) Reliability (b) Recall (c) F1 score (d) Accuracy

Q7. In model evaluation, what does 'error' refer to? **[1]**

(a) The total number of features
(b) The difference between predicted and actual values
(c) The number of layers in a neural network
(d) The training time of the model

Q8. In supervised learning, what is the purpose of the testing dataset? **[1]**

[Board 2026]

(a) To train the model. (b) To create new features.
(c) To evaluate the model's accuracy. (d) To label the data.

Q9. A True Negative is a case where: **[1]**

(a) The actual value is negative and the prediction is negative
(b) The actual value is positive and the prediction is positive
(c) The actual value is negative and the prediction is positive
(d) The actual value is positive and the prediction is negative

Q10. Which of the following is a likely cause of underfitting? **[1]**

(a) The model is trained on too many labelled examples
(b) The model is too simple to capture the pattern in the data
(c) The testing data is kept separate from the training data
(d) The model is evaluated using a confusion matrix

Q11. Clearly explaining how a model was evaluated, including its limitations, is an ethical practice called: **[1]**

(a) Transparency (b) Overfitting (c) Recall (d) Underfitting

Q12. A dataset is divided into 80% for training and 20% for testing. This is known as: **[1]**

(a) Train-test split (b) Feature selection (c) Confusion analysis (d) Feature scaling

Assertion–Reason

Q13. **Assertion (A):** A model with high training accuracy but low testing accuracy is well generalised.
Reason (R): Overfitting produces a large gap between training and testing performance. **[1]**
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true, but Reason (R) is false.
(d) Assertion (A) is false, but Reason (R) is true.

Q14. **Assertion (A):** The F1 score is high even when precision is very low.
Reason (R): F1 score is the harmonic mean of precision and recall, which is pulled down by a low value. **[1]**
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true, but Reason (R) is false.
(d) Assertion (A) is false, but Reason (R) is true.

Q15. **Assertion (A):** The F1 score is a suitable metric when the classes are imbalanced.
Reason (R): Accuracy alone can be misleading on imbalanced data. **[1]**
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true, but Reason (R) is false.
(d) Assertion (A) is false, but Reason (R) is true.

Very Short Answer (VSA)

Q16. _____ is the proportion of actual positive cases that the model correctly identifies. **[1]**

Q17. The data that the model uses to learn patterns is called the _____ data. **[1]**

Q18. Precision = TP / (_____). **[1]**

Q19. With reference to the evaluation process of an AI model, define the term True Positive. **[1]**

[Board 2022]

Short Answer (SA)

Q20. What is model evaluation in machine learning, and how does it help improve an AI model? **[2]**

[SQP 2025-26]

Q21. A model correctly identified 150 of the 200 actual positive samples. Calculate its recall. Show your working. **[2]**

Q22. Draw the confusion matrix for the following data: True Positive = 100, True Negative = 47, False Positive = 62, False Negative = 290. **[2]**

[SQP 2024-25]

	Reality: Yes	**Reality: No**
Prediction: Yes	100 (TP)	62 (FP)
Prediction: No	290 (FN)	47 (TN)

Q23. Why is the F1 score useful when both precision and recall matter? **[2]**

Q24. A house was predicted at Rs. 50 lakh but sold for Rs. 55 lakh. Calculate the error and the error rate of the prediction. **[2]**

Long Answer (LA)

Q25. Describe the process of evaluating an AI model using the train-test split. Why must the testing data be unseen by the model during training? **[4]**

Q26. A police department uses a face-recognition system that reports 97% accuracy. Discuss two ethical concerns in the evaluation of this system and suggest one measure to address each concern. **[4]**

Case Study

Case Study: An AI model made sales predictions for a newly launched mobile phone. Its confusion matrix is given below.

	Reality: Yes	**Reality: No**
Prediction: Yes	50	40
Prediction: No	12	10

Q27. Answer the following questions based on the case above. **[4]**

[SQP 2024-25]

(i) Identify the total number of wrong predictions made by the model. [1]

(ii) Calculate the precision. [1]

(iii) Calculate the recall. [1]

(iv) Calculate the F1 score. [1]

Case Study: A school tested an AI model that predicts whether 100 students will pass or fail their final exam. The model correctly predicted that 40 students would pass and they did. It correctly identified 30 students who would fail. It predicted that 20 students would pass, but they failed. It predicted that 10 students would fail, but they passed.

Q28. Answer the following questions based on the case above. **[4]**

[SQP 2025-26]

(a) Draw the confusion matrix based on the information. [2]

(b) Calculate the accuracy of the model. Show your working. [1]

(c) Write the total number of wrong predictions made by the model. [1]

9. Computer Vision

Part B, Unit 5

Multiple Choice Questions (MCQs)

Q1. Anita and Surjit are creating an AI application that will classify different types of fruits. The Computer Vision task that will identify the type of fruit and assign a label to it is called _____. **[1]**

[Board 2026]

(a) Segmentation
(b) Classification
(c) Classification + Localization
(d) Object Detection

Q2. The correct sequence of steps in Computer Vision processing is: **[1]**

(a) analysing, acquiring, extracting, screening, identifying
(b) screening, extracting, acquiring, identifying, analysing
(c) extracting, identifying, analysing, screening, acquiring
(d) acquiring, screening, analysing, identifying, extracting

Q3. In Computer Vision, which of the following tasks is used for single object? **[1]**

[Board 2025]

(a) Object Detection
(b) Classification + Localization
(c) Instance Segmentation
(d) Non-Localization

Q4. Which RGB value combination produces yellow? **[1]**

(a) (0, 0, 255) (b) (255, 255, 0) (c) (0, 255, 0) (d) (0, 0, 0)

Q5. Which of these is an example of a grayscale image? **[1]**

(a) A colour photo of a flower
(b) An RGB wallpaper
(c) A coloured road map
(d) A black-and-white X-ray scan

Q6. Which of these is NOT a valid input for a Computer Vision system? **[1]**

(a) Plain typed text documents
(b) Photographs
(c) Videos
(d) Thermal sensor images

Q7. The 2×2 image [[1, 2], [3, 4]] is convolved with the kernel [[1, 0], [0, 1]], giving one output value. The value is: **[1]**

(a) 3 (b) 7 (c) 10 (d) 5

Q8. The ReLU output for input –4 is: **[1]**

(a) 0 (b) 4 (c) –4 (d) 1

Q9. In the context of Computer Vision vs Image Processing, which statement correctly differentiates them? **[1]**

[Board 2026]

(a) Computer Vision and Image Processing are exactly the same.
(b) Computer Vision enhances the image while Image Processing does not.
(c) Computer Vision is a superset of Image Processing.
(d) Image Processing is a superset of Computer Vision.

Q10. The output of a convolution layer is called a: **[1]**

(a) word vector (b) feature map (c) byte image (d) confusion matrix

Q11. The term 'channel' in an image refers to: **[1]**

(a) a single colour component of the image
(b) the internet connection used to upload a photo
(c) a type of pixel
(d) the size in bytes

Q12. Which statement correctly describes a grayscale image? **[1]**

(a) Each pixel has one intensity value
(b) Each pixel has three values
(c) It has no pixels
(d) Each pixel is stored in 16 bits

Assertion–Reason

Q13. **Assertion (A):** Pooling layers increase the size of feature maps.
Reason (R): Pooling layers reduce the size of feature maps. **[1]**
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true, but Reason (R) is false.
(d) Assertion (A) is false, but Reason (R) is true.

Q14. **Assertion (A):** Image classification draws bounding boxes around objects.
Reason (R): Image classification assigns a single label to the whole image. **[1]**
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true, but Reason (R) is false.
(d) Assertion (A) is false, but Reason (R) is true.

Q15. **Assertion (A):** Convolution extracts features such as edges from an image.
Reason (R): A kernel slides over the image and computes weighted sums of pixel values. **[1]**
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true, but Reason (R) is false.
(d) Assertion (A) is false, but Reason (R) is true.

Very Short Answer (VSA)

Q16. The activation function _____ replaces negative values in a feature map with zero. **[1]**

Q17. In a grayscale byte image, the pixel value 0 represents the colour _____. **[1]**

Q18. The CNN layer that reduces the size of the feature map is the _____ layer. **[1]**

Q19. State True or False: Facial recognition and face filters are both applications of Computer Vision. **[1]**

Short Answer (SA)

Q20. Explain the term resolution with an example. **[2]**

[SQP 2023-24; SQP 2024-25; MS 2024-25]

Q21. What is image segmentation? How does instance segmentation differ from it? **[2]**

Q22. What is a pixel? Why does resolution affect image quality? **[2]**

Q23. Explain how Google Search by Image works. **[2]**

Q24. What is ReLU? Explain its function in a CNN. **[2]**

Long Answer (LA)

Q25. Explain the four Computer Vision tasks: classification, classification + localisation, object detection and instance segmentation. Give one example of each. **[4]**

Q26. Explain the four types of layers in a Convolutional Neural Network (CNN): convolution layer, ReLU, pooling layer and fully connected layer. **[4]**

Case Study

Case Study: A school stores a 200 × 200 digital image in two formats: grayscale (1 byte per pixel) and RGB (3 bytes per pixel).

Q27. Answer the following questions based on the case above. **[4]**

(i) How many pixels does the image have? [1]

(ii) How many bytes does the grayscale version need? [1]

(iii) How many bytes does the RGB version need? [1]

(iv) The school wants a botany poster showing flower colours. Which format should it use, and why? [1]

Case Study: A convolution layer gives the 4 × 4 feature map below. ReLU is applied first, and then 2 × 2 max pooling with stride 2 is applied.

Col 1	Col 2	Col 3	Col 4
2	-1	3	0
4	1	-2	5
-3	2	1	1
0	6	2	-4

Q28. Answer the following questions based on the case above. **[4]**

(i) After ReLU, what is the output for the value –2 in row 2, column 3? [1]

(ii) After ReLU, what is the maximum value in the top-left 2 × 2 block? [1]

(iii) What is the size of the output after 2 × 2 max pooling with stride 2? [1]

(iv) Write the complete pooled output, and state in one line why pooling is useful. [1]

10. Natural Language Processing

Part B, Unit 6

Multiple Choice Questions (MCQs)

Q1. Which normalisation step removes words such as 'the', 'is' and 'and' that add little meaning? **[1]**

(a) Stemming (b) Tokenisation
(c) Lemmatisation (d) Removing stop words

Q2. In TF-IDF, the term frequency of a word in a document is: **[1]**

(a) the number of documents that contain the word
(b) the number of times the word appears in that document
(c) the total number of documents in the corpus
(d) the number of letters in the word

Q3. A corpus contains 4 documents in which words such as 'an', 'is' and 'the' appear frequently. What is the term used for such words? **[1]**

[Board 2025; Board 2025 Comptt]

(a) Stop word (b) Rare word (c) Missing word (d) Removable word

Q4. For a word to get a high TF-IDF value in a document, it should have: **[1]**

(a) high term frequency and low document frequency
(b) low term frequency and high document frequency
(c) high term frequency and high document frequency
(d) low term frequency and low document frequency

Q5. Consider the sentence: On seeing her son's result, Pooja's face turned red with anger. The word 'red' demonstrates which characteristic of natural language? **[1]**

[Board 2026]

(a) Redundancy (b) Context-dependent meaning
(c) Grammatical structure (d) Temporal change

Q6. A document contains the word 'data' three times. Its Bag of Words entry for 'data' is: **[1]**

(a) 0 (b) 1 (c) 3 (d) 13

Q7. The vocabulary is [cat, dog, fish]. For the text 'dog dog fish', the Bag of Words vector is: **[1]**

(a) [1, 2, 1] (b) [0, 2, 1] (c) [1, 1, 1] (d) [0, 1, 1]

Q8. Which NLP application converts text or speech from one language to another? **[1]**

(a) Sentiment analysis (b) Keyword extraction
(c) Text classification (d) Language translation

Q9. Bag of Words is a model which helps in extracting features out of the text, which can be helpful in machine learning algorithms. It belongs to which field? **[1]**

[Board 2024]

(a) Data Science (DS) (b) Virtual Reality (VR)
(c) Natural Language Processing (NLP) (d) Computer Vision (CV)

Q10. Which application of NLP provides an overview of a news item or blog post while avoiding redundancy from multiple sources? **[1]**

[Board 2025; Board 2024]

(a) Virtual Assistants (b) Sentiment Analysis
(c) Text Classification (d) Automatic Summarization

Q11. Which two things does the Bag of Words algorithm give? **[1]**

(a) A vocabulary and the frequency of its words
(b) A speech recording and captions
(c) A sentiment score and a label
(d) Pixel values and resolution

Q12. Which application of NLP is associated with spam filtering in e-mails? **[1]**

[Board 2025]

(a) Virtual Assistants
(b) Sentiment Analysis
(c) Text Classification
(d) Automatic Summarization

Assertion–Reason

Q13. **Assertion (A):** Converting text to lowercase is preferable in text preprocessing.
Reason (R): It ensures that 'Hello' and 'hello' are treated as the same word by the machine. **[1]**
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true, but Reason (R) is false.
(d) Assertion (A) is false, but Reason (R) is true.

[Board 2026]

Q14. **Assertion (A):** Stop words are removed during text normalisation.
Reason (R): Stop words occur very frequently in a corpus but add little meaning to it. **[1]**
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true, but Reason (R) is false.
(d) Assertion (A) is false, but Reason (R) is true.

Q15. **Assertion (A):** Autogenerated captions help viewers who cannot hear the audio.
Reason (R): NLP converts natural speech into text in real time. **[1]**
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true, but Reason (R) is false.
(d) Assertion (A) is false, but Reason (R) is true.

Very Short Answer (VSA)

Q16. Name the NLP stage that checks the grammar of sentences and phrases. **[1]**

Q17. Name the NLP stage that checks whether every word and phrase in a sentence is meaningful. **[1]**

Q18. Count and write the number of tokens in the sentence: 'Words with adequate occurrence in a corpus are considered frequent and often reflect the main subject of the document, unlike stop words whose frequency is high but value is low.' **[1]**

[SQP 2025-26]

Q19. A word occurs in all 5 documents of a corpus. Its IDF (total documents divided by document frequency, before the log) is _____. **[1]**

Short Answer (SA)

Q20. How is stemming different from lemmatisation? Explain how the word 'Wolves' would be processed by stemming and by lemmatisation. **[2]**

[Board 2026]

Q21. Differentiate between tokenisation and removal of stop words. Give one example of each. **[2]**

Q22. What is discourse integration? Explain with an example. **[2]**

Q23. What is tokenisation? Count the tokens in the statement: 'I find that the harder I work, the more luck I seem to have.' **[2]**

[Board 2022]

Q24. What is keyword extraction? Name one use. **[2]**

Long Answer (LA)

Q25. Explain the five stages of NLP (lexical, syntactic, semantic, discourse integration and pragmatic analysis) with one example for each. **[4]**

Q26. Explain three applications of NLP that can help students in a school, with an example for each. **[4]**

Case Study

Case Study: A beginner compares two normalisation methods. The table shows the stem produced by stemming and the lemma produced by lemmatisation for four words.

Word	Affix removed	Stem (stemming)	Lemma (lemmatisation)
studies	-es	studi	study
flies	-es	fli	fly
wolves	-es	wolv	wolf
healing	-ing	heal	heal

Q27. Answer the following questions based on the case above. **[4]**

(i) Which entries in the Stem column are not meaningful words? [1]

(ii) Which of the two methods takes longer to execute, and why? [1]

(iii) Why does lemmatisation give 'study' for 'studies', while stemming gives 'studi'? [1]

(iv) Name the affix removed from 'healing'. Are the stem and the lemma the same here? [1]

Case Study: You have two documents. Document 1: 'NLP is a domain of AI.' Document 2: 'NLP stands for Natural Language Processing.' Implement all four steps of the Bag of Words model to create a document vector table, and depict the outcome of each step. (Stop words are not removed, as the question asks only for the four steps.)

Q28. Answer the following questions based on the case above. **[4]**

[Board 2025]

(i) Write the normalised tokens of Document 1 and Document 2. [1]

(ii) Create the dictionary of unique words. [1]

(iii) Create the document vectors for both documents. [2]

Answer Key (MCQs and Assertion–Reason)

Ch. 1: Q1-(c), Q2-(b), Q3-(b), Q4-(d), Q5-(d), Q6-(a), Q7-(b), Q8-(a), Q9-(c)

Ch. 2: Q1-(d), Q2-(d), Q3-(a), Q4-(b), Q5-(b), Q6-(b), Q7-(c), Q8-(b), Q9-(a)

Ch. 3: Q1-(a), Q2-(a), Q3-(b), Q4-(d), Q5-(c), Q6-(b), Q7-(d), Q8-(b), Q9-(c)

Ch. 4: Q1-(c), Q2-(d), Q3-(c), Q4-(d), Q5-(a), Q6-(b), Q7-(a), Q8-(d), Q9-(a)

Ch. 5: Q1-(b), Q2-(a), Q3-(a), Q4-(d), Q5-(d), Q6-(c), Q7-(b), Q8-(d), Q9-(b)

Ch. 6: Q1-(c), Q2-(d), Q3-(c), Q4-(d), Q5-(d), Q6-(c), Q7-(c), Q8-(a), Q9-(d), Q10-(b), Q11-(c), Q12-(b), Q13-(a), Q14-(a), Q15-(c)

Ch. 7: Q1-(a), Q2-(b), Q3-(a), Q4-(b), Q5-(b), Q6-(c), Q7-(a), Q8-(b), Q9-(b), Q10-(d), Q11-(a), Q12-(a), Q13-(d), Q14-(c), Q15-(b)

Ch. 8: Q1-(c), Q2-(a), Q3-(a), Q4-(c), Q5-(b), Q6-(d), Q7-(b), Q8-(c), Q9-(a), Q10-(b), Q11-(a), Q12-(a), Q13-(d), Q14-(d), Q15-(b)

Ch. 9: Q1-(b), Q2-(d), Q3-(b), Q4-(b), Q5-(d), Q6-(a), Q7-(d), Q8-(a), Q9-(c), Q10-(b), Q11-(a), Q12-(a), Q13-(d), Q14-(d), Q15-(a)

Ch. 10: Q1-(d), Q2-(b), Q3-(a), Q4-(a), Q5-(b), Q6-(c), Q7-(b), Q8-(d), Q9-(c), Q10-(d), Q11-(a), Q12-(c), Q13-(a), Q14-(a), Q15-(b)