

CBSE | DEPARTMENT OF SKILL EDUCATION

ARTIFICIAL INTELLIGENCE (SUBJECT CODE - 417)

MARKING SCHEME FOR CLASS X (SESSION 2025-2026)

Max. Time: 2 Hours

Max. Marks: 50

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. **Out of the given (5 + 16 =) 21 questions, a candidate has to answer (5 + 10 =) 15 questions in the allotted (maximum) time of 2 hours.**
5. All questions of a particular section must be attempted in the correct order.
6. **SECTION A - OBJECTIVE TYPE QUESTIONS (24 MARKS):**
 - i. This section has 05 questions.
 - ii. There is no negative marking.
 - iii. Do as per the instructions given.
 - iv. Marks allotted are mentioned against each question/part.
7. **SECTION B – SUBJECTIVE TYPE QUESTIONS (26 MARKS):**
 - i. This section contains 16 questions.
 - ii. A candidate has to do 10 questions.
 - iii. Do as per the instructions given.
 - iv. Marks allotted are mentioned against each question/part.

SECTION A: OBJECTIVE TYPE QUESTIONS

Q. No.	QUESTION	Source Material (NCERT/PSSCIVE/ CBSE Study Material)	Unit/ Chap. No.	Page no. of source material	Marks
Q. 1	Answer any 4 out of the given 6 questions on Employability Skills (1 x 4 = 4 marks)				
i.	c) Gesture	NCERT	1	11	1
ii.	b) Responsibility	NCERT	2	40	1
iii.	a) Making decisions purely based on emotions	NCERT	2	44	1
iv.	d) Hover	NCERT	3	67	1
v.	c) Grow	NCERT	4	100	1
vi.	a) SDG 12 – Responsible Consumption and Production	NCERT	5	112	1
Q. 2	Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)				
i.	Three	CBSE Study material	1	9	1
ii.	a) Both A and R are correct, and R is the correct explanation of A	CBSE Study material	1	16	1
iii.	b) The rule-based approach is static and cannot adapt to new words or expressions.	CBSE Study material	2	30	1

iv.	Evaluation	CBSE Study material	3	62	1
v.	c) Image Processing; Computer Vision	CBSE Study material	5	123	1
vi.	True	CBSE Study material	6	154	1
Q. 3	Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)				
i.	d) Computer Vision	CBSE Study material	1	10	1
ii.	d) Features	CBSE Study material	2	28	1
iii.	a) 0.80	CBSE Study material	3	77	1
iv.	a) Both A and R are correct, and R is the correct explanation of A.	CBSE Study material	3	65	1
v.	d) Face Filters	CBSE Study material	5	124	1
vi.	32	CBSE Study material	6	165	1
Q. 4	Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)				
i.	a) Step-by-step guidance	CBSE Study material	1	12	1
ii.	b) Both Statement 1 and Statement 2 are incorrect.	CBSE Study material	2	28,29	1
iii.	c) 1.7	CBSE Study material	2	51	1
iv.	d) It may lead to overfitting and give an overly optimistic accuracy	CBSE Study material	3	64	1
v.	b) Resolution	CBSE Study material	5	128	1
vi.	a) Autogenerated captions	CBSE Study material	6	155	1
Q. 5	Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)				
i.	a) Location of the recipient	CBSE Study material	1	14	1
ii.	b) 0.071	CBSE Study material	3	66	1
iii.	c) Object Detection	CBSE Study material	5	126	1
iv.	False Positive	CBSE Study material	3	73	1
v.	a) Script Bot	CBSE Study material	6	163	1
vi.	d) Stemmed: fli, Lemmatized: fly	CBSE Study material	6	167,168	1

SECTION B: SUBJECTIVE TYPE QUESTIONS

Q. No.	QUESTION	Source Material (NCERT/ PSSCIVE/ CBSE Study Material)	Unit / Chap No.	Page no. of source material	Marks
Answer any 3 out of the given 5 questions on Employability Skills in 20 – 30 words each (2 x 3 = 6 marks)					
Q. 6	Words used in place of a noun are called pronouns. Eg: Kavita bought a book. She has a great book collection. 'She' is used in place of the noun 'Kavita'. (1 mark for explanation and 1 mark for example)	NCERT	1	26	2
Q. 7	The four steps to build self-motivation are: 1. Find out your strengths 2. Set and focus on your goals 3. Develop a plan to achieve your goals 4. Stay loyal to your goals (½ mark for each point)	NCERT	2	52	2
Q. 8	Personal information can be lost or leaked in two ways: 1. We are not careful in giving out personal information over the Internet. For example, we share our account details and password on unsecure sites. 2. A person gets unauthorised access to our computer. This can happen in the office if we leave our computer without logging out. (1 mark for each point)	NCERT	3	80	2
Q. 9	• Making Decisions • Managing the Business (1 mark for each point)	NCERT	4	93	2
Q. 10	Organic farming is where farmers do not use chemical pesticides and fertilisers to increase their production. Benefits: 1. It helps in growing better quality, chemical-free crops. 2. It maintains the soil quality for future use. (1 mark for definition; ½ mark for each benefit)	NCERT	5	107	2
Answer any 4 out of the given 6 questions in 20 – 30 words each (2 x 4 = 8 marks)					
Q. 11	In the second stage, we need to acquire data, which becomes the base of our project. This data helps us understand the parameters related to problem scoping. We collect it from various reliable and authentic sources. In the third stage, we give the acquired data a visual representation using graphs, databases, flowcharts, maps, etc. Since the data is often large in quantity, visualizing it helps us interpret patterns more easily and draw meaningful insights. (1 mark for each explanation)	CBSE Study material	1	9	2

Q. 12	a) Convolutional Neural Network (CNN) b) Artificial Neural networks (ANN) (1 mark for each)	CBSE Study material	2	45	2
Q. 13	1. For supervised learning and unsupervised learning, you need to have a pretty good idea of the data that you have, what's going on, and how to solve the problem. 2. However, you will frequently encounter situations where you have to deal with large complex problem spaces. 3. You may need to respond to unforeseen environments, and you don't have sufficient data on those specific scenarios. 4. The environment may change. Hence your system needs to be adaptive. (any 2 points; one mark for each point)	CBSE Study material	2	37	2
Q. 14	Model evaluation is the process of using different evaluation metrics to understand a machine learning model's performance. It helps us understand the model's strengths, weaknesses, and suitability for the task at hand. An AI model gets better with constructive feedback. We build a model, get feedback from metrics, make improvements, and continue this process until we achieve a desirable accuracy. This feedback loop is essential for building trustworthy and reliable AI systems. (1 mark for definition, 1 mark for explanation)	CBSE Study material	3	62,63	2
Q. 15	The most common pixel format is the byte image, where each pixel value is stored as an 8-bit integer, giving a range of possible values from 0 to 255. In this format, 0 is typically taken as no colour or black, and 255 is taken as full colour or white. In computer systems, data is represented in the binary system, using ones and zeros. Each bit can have two possible values, and since 1 byte = 8 bits, this results in 256 possible values, ranging from 0 to 255. Therefore, each pixel in a byte image uses 1 byte of data. (1 mark for correctly stating the definition; 1 mark for explaining how the binary system relates to this format)	CBSE Study material	5	128	2
Q. 16	The stage of NLP is Syntactic Analysis / Parsing. It is the process of checking the grammar of sentences and phrases. It forms a relationship among words and eliminates logically incorrect sentences. (1 mark for identifying the stage; 1 mark for relevant explanation)	CBSE Study material	6	159	2

Answer any 3 out of the given 5 questions in 50– 80 words each (4 x 3 = 12 marks)					
Q. 17	a) Two reasons why the algorithm gave biased results: 1. The algorithm unfairly penalized students who are not fluent in English, assuming slower form completion indicates lower competence, when it may simply reflect language challenges. 2. Students without access to a computer or stable internet at home took longer to complete the application, but this delay is due to external socio-economic factors, not lack of ability or confidence. (1 mark for each valid reason) b) Two bioethics principles that can solve this problem are: 1. Do Not Harm: The algorithm unintentionally harms students from less privileged backgrounds by reducing their chances of selection. To follow this principle, the AI system should be redesigned to avoid causing unfair disadvantages. 2. Give Justice: Justice requires that all students are treated fairly and equitably. The system should not discriminate based on factors like language fluency or digital access. Incorporating diverse data and adjusting evaluation criteria would help ensure equal opportunity for all applicants. (½ mark for each correct bioethics principle and ½ mark for the each relevant explanation)	CBSE Study material	1	18,19	4
Q. 18	a) The learning model is called Unsupervised Learning. (1 mark) b) The two categories of this learning model are Clustering and Association. (½ mark each) c) Clustering: This involves finding similarities between objects and placing them in the same cluster and differentiating them from objects in other clusters. <i>Example: Grouping customers based on purchasing behaviour.</i> (1 mark – ½ for explanation, ½ for example) Association: This involves finding relationships or correlations between variables in large datasets. <i>Example: Market basket analysis (e.g., customers who buy bread often buy butter).</i> (1 mark – ½ for explanation, ½ for example)	CBSE Study material	2	41,42, 43	4
Q. 19	a) Anomaly Detection b) Object Classification c) Object Identification d) Digit Recognition (1 mark each)	CBSE Study material	2	26,27	4

Q. 20	a) <table><tr><th colspan="2" rowspan="2">Confusion Matrix</th><th colspan="2">Prediction</th></tr><tr><th>Yes</th><th>No</th></tr><tr><th rowspan="2">Reality</th><th>Yes</th><td>40 (TP)</td><td>10 (FN)</td></tr><tr><th>No</th><td>20 (FP)</td><td>30 (TN)</td></tr></table> (½ mark each for correctly identifying and writing values of TP, FP, TN, FN) b) Classification Accuracy $\text{Accuracy} = \frac{\text{Correct Predictions}}{\text{Total Predictions}}$ $= \frac{TP + TN}{TP + FP + TN + FN}$ $= \frac{40 + 30}{40 + 20 + 30 + 10}$ $= \frac{70}{100} = \underline{\underline{0.7}}$ Accuracy% = 70% (½ mark for formula; ½ mark for the answer) c) Wrong Predictions = FP+FN =20+10 =30 (½ mark for formula; ½ mark for the answer)	Confusion Matrix		Prediction		Yes	No	Reality	Yes	40 (TP)	10 (FN)	No	20 (FP)	30 (TN)	CBSE Study material	3	75,76	4									
Confusion Matrix				Prediction																							
		Yes	No																								
Reality	Yes	40 (TP)	10 (FN)																								
	No	20 (FP)	30 (TN)																								
Q. 21	a) Dictionary of unique words will be students, love, studying, ai, is, transforming, education, teachers, and, explore, tools (1 mark for correctly listing all unique words for the vocabulary) b) Document vector for Document 3 <table><tr><td>students</td><td>love</td><td>studying</td><td>ai</td><td>is</td><td>transforming</td><td>education</td><td>teachers</td><td>and</td><td>explore</td><td>tools</td></tr><tr><td>1</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td></tr></table> (1 mark for accurately constructing the document vector for Document 3 using the given vocabulary) c) Bag of Words (BoW) helps in feature extraction by converting text documents into fixed-length numerical vectors based on the frequency or presence of words from a defined vocabulary. This allows machine learning models to process and analyze text data just like numeric input, enabling tasks such as text classification, sentiment analysis, and topic modeling. (1 mark for clearly explaining how Bag of Words helps in feature extraction by counting word occurrences) d) In Bag of Words, the focus is on what words appear, not how or where they appear in the sentence. The model treats text as a "bag" of words, ignoring grammar, syntax, and word order. (1 mark for correctly stating that word order is not important in BoW as it only considers frequency or presence of words)	students	love	studying	ai	is	transforming	education	teachers	and	explore	tools	1	0	0	1	0	0	0	1	1	1	1	CBSE Study material	6	169, 170,171	4
students	love	studying	ai	is	transforming	education	teachers	and	explore	tools																	
1	0	0	1	0	0	0	1	1	1	1																	