CBSE | DEPARTMENT OF SKILL EDUCATION

ARTIFICIAL INTELLIGENCE (SUBJECT CODE - 417)

Blue-print for Sample Question Paper for Class X (Session 2026-2027)

Max. Time: 2 Hours **Max. Marks: 50**

PART A - EMPLOYABILITY SKILLS (10 MARKS):

UNIT NO.	NAME OF THE UNIT	OBJECTIVE TYPE QUESTIONS	SHORT ANSWER TYPE QUESTIONS	TOTAL QUESTIONS
		1 MARK EACH	2 MARKS EACH	
1	Communication Skills – II	1	1	2
2	Self-Management Skills – II	2	1	3
3	ICT Skills – II	1	1	2
4	Entrepreneurial Skills – II	1	1	2
5	Green Skills – II	1	1	2
TOTAL QUESTIONS		**6**	**5**	**11**
NO. OF QUESTIONS TO BE ANSWERED		**Any 4**	**Any 3**	**07**
TOTAL MARKS		**1 x 4 = 4**	**2 x 3 = 6**	**10 MARKS**

PART B - SUBJECT SPECIFIC SKILLS (40 MARKS):

UNIT NO.	NAME OF THE UNIT	OBJECTIVE TYPE QUESTIONS	SHORT ANSWER TYPE QUESTIONS	DESCRIPTIVE/ LONG ANS. TYPE QUESTIONS	TOTAL QUESTIONS
		1 MARK EACH	2 MARKS EACH	4 MARKS EACH	
1	Unit 1: Revisiting AI Project Cycle & Ethical Frameworks for AI	5	1	1	7
2	Unit 2: Advanced Concepts of Modeling in AI	4	2	2	8
3	Unit 3: Evaluating Models	6	1	1	8
4	Unit 5: Computer Vision	4	1	-	5
5	Unit 6: Natural Language Processing	5	1	1	7
TOTAL QUESTIONS		**24**	**6**	**5**	**35**
NO. OF QUESTIONS TO BE ANSWERED		**Any 20**	**Any 4**	**Any 3**	**Any 27**
TOTAL MARKS		**1 x 20 = 20**	**2 x 4 = 8**	**4 x 3 = 12**	**40 MARKS**

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Max. Time: 2 Hours **Max. Marks: 50**

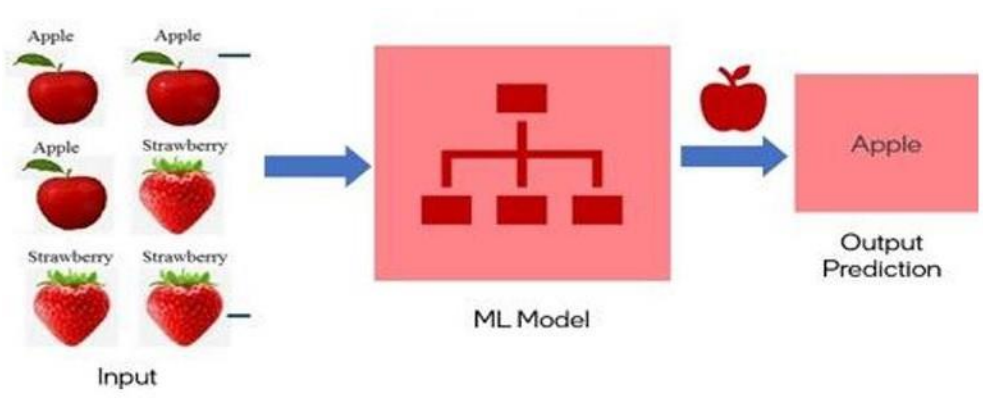
General Instructions:

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.** Marks allotted are mentioned against each question/part.
   - **iii.** There is no negative marking.
   - **iv.** Do as per the instructions given.
7. **SECTION B – SUBJECTIVE TYPE QUESTIONS (26 MARKS):**
   - **i.** This section has 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

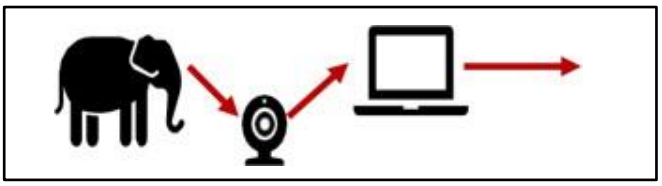
Q. 1	**Answer any 4 out of the given 6 questions on Employability Skills (1 x 4 = 4 marks)**	
i.	Which of the following is NOT an element of communication within the communication process cycle? a) Channel b) Receiver c) Sender d) Time	1

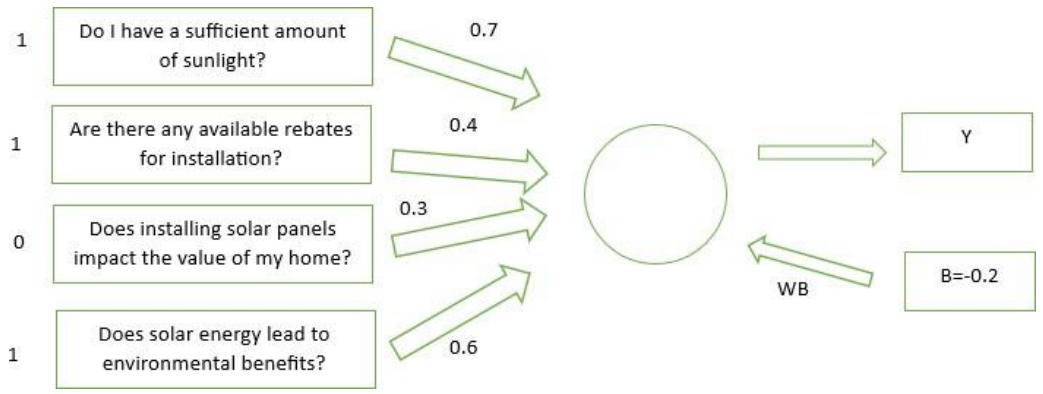
ii.	Identify the correct sequence of steps to manage stress. i. Apply stress management methods. ii. Be aware that you are stressed. iii. Identify what is causing you stress. a) i -> ii -> iii b) ii -> i -> iii c) iii -> i -> ii d) ii -> iii -> i	1
iii.	Ravi works hard to get the best student award at the end of the year. What type of motivation is this? a) Internal b) External c) Both internal and external d) Not any specific type of motivation	1
iv.	Which of the following is a valid file extension for Notepad file? a) .jpg b) .doc c) .text d) .txt	1
v.	Having launched a new business, Sanchi is confused about the functions of an entrepreneur. Which of the following is not a function of an entrepreneur? a) Managing the business and taking a risk b) Creating a new method, idea or product c) Blaming employees for wrong decisions d) Divide income	1
vi.	Narayana Peesapaty made edible cutlery made out of a grain — these spoons can be eaten and even if they are not eaten, they will easily decompose in the soil enriching it. Identify the SDG covered in this case. a) Responsible Consumption and Production b) Zero Hunger c) Clean Water and Sanitation d) Affordable and Clean Energy	1
Q. 2	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**	

i.	Which stage of NLP is shown in the image given below:-  a) Syntactic Analysis b) Syntactic Parsing c) Discourse Integration d) Pragmatic Analysis	1
ii.	Assertion (A): Computer vision enables machines to interpret and understand images and videos. Reason (R): Computer vision systems use sensors to feel the texture of objects. a) Both A and R are true, and R is the correct explanation of A b) Both A and R are true, but R is not the correct explanation of A c) A is true, but R is false d) A is false, but R is true	1
iii.	What is the main purpose of the "Model Building" stage in the AI project cycle? a) Visualizing data b) b) Collecting feedback c) Training and testing AI algorithms d) Choosing the target audience	1
iv.	A high F1 score generally suggests: a) A significant imbalance between precision and recall b) A good balance between precision and recall c) A model that only performs well on specific data points d) The need for more training data	1
v.	 	1

	Analyse the above image and identify the type of learning model. a) Classification b) Regression c) Clustering d) Association	
vi.	An AI model is deployed to issue flood warnings for surrounding villages, enabling residents and authorities to take preventive measures. One day, the model alerts of a possible flood, but it turns out to be a false alarm. What does this scenario represent? a) True Positive b) True Negative c) False Positive d) False Negative	1
Q. 3	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**	
i.	Which of the following sentences uses "bark" to refer to the outer covering of a tree? a) The dog's bark startled the sleeping baby. b) The bark of the tree was rough and peeling. c) He barked orders at the team during the meeting. d) She heard a bark echo through the alley	1
ii.	What is object detection in computer vision? a) Finding hidden files in a computer b) Detecting objects in images or videos c) Searching for emails d) Identifying the location	1
iii.	What does the ethical principle of "Non-maleficence" mean? a) Always tell the truth b) Do no harm c) Share data openly d) Collect as much data as possible	1
iv.	**Statement 1:** Value-based frameworks guide AI systems to align with human values such as fairness, privacy, and respect. **Statement 2:** Value-based frameworks encourage AI developers to ignore social and cultural diversity while designing AI systems. a) Both Statement 1 and Statement 2 are correct. b) Both Statement 1 and Statement 2 are incorrect. c) Only Statement 1 is correct. d) Only Statement 2 is correct.	1

v.	A video game AI is being trained to learn strategies by playing against itself and receiving rewards for winning and penalties for losing. Identify the type of learning. a) Supervised Learning b) Unsupervised Learning c) Reinforcement Learning d) Rule-Based Learning	1
vi.	Precision is one of the evaluation metrics. a) Defined as the fraction of positive cases that are correctly identified, taking into account the true reality cases. b) Ratio of total number of correctly classified positive examples and the total number of predicted positive examples. c) Defined as the percentage of correct predictions out of all the observations. d) Comparison between the prediction and reality	1
Q. 4	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**	
i.	In online retail (e-commerce), computer vision is used for:- a) Detecting fake reviews b) Suggesting product names c) Visual search and virtual try-on d) Managing bank accounts	1
ii.	Which of the following is a lemma of the word " happier"? a) happiest b) happiness c) happily d) happy	1
iii.	Which of the following is an example of following an ethical framework? a) Using personal data without permission b) Testing AI for bias before deployment c) Hiding how AI makes decisions d) Using only one type of data source	1
iv.	How many tokens are in the sentence: *AI, ML and NLP are changing the world.* a) 8 b) 9 c) 10 d) 11	1
v.	**Assertion (A):** Supervised learning is not suitable for tasks like clustering. **Reason (R) :** Clustering algorithms require labelled data to group similar data points. a) Both A and R are true, and R is the correct explanation of A b) Both A and R are true, but R is not the correct explanation of A c) A is true, but R is false d) A is false, but R is true	1

vi.	A new medical test is being evaluated for its ability to detect a particular disease. Out of 200 tests conducted: ● 80 tests correctly identified the presence of the disease. ● 30 tests incorrectly identified the disease when it wasn't present. ● 40 tests failed to detect the disease even though it was present. What is the precision of the test? a) 0.73 b) 0.50 c) 0.64 d) 0.57	1
Q. 5	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**	
i.	What is the main objective of **keyword extraction** in NLP? a) Translate text into another language b) Identify the most relevant words or phrases that represent the main topics of a text c) Remove stopwords from a document d) Generate a summary of the entire document	1
ii.	Based on the image given below, select the correct answer-  a) Real object → Interpreting Device →Sensing device b) Interpreting Device →Sensing device→Real object c) Real object →Sensing device→ Interpreting Device d) Sensing device→ Real object → Interpreting Device	1
iii.	The train-test split is a technique for evaluating the performance of a machine learning algorithm. What is not true about this technique? a) It is appropriate when there is a sufficiently large dataset available b) It can be used for any unsupervised learning algorithm c) The procedure involves taking a dataset and dividing it into two subsets: The training dataset and the testing dataset d) The objective is to estimate the performance of the machine learning model on new data	1
iv.	A homeowner is deciding whether to invest in solar panels for their house. The model considers four key attributes, each assigned a weight based on importance.	1

	 A bias value of -**0.2** is added. The formula used is: $y=w_1x_1+w_2x_2+w_3x_3+w_4x_4+(1\times b)$ **What will be the value of y for the given scenario?** a) 2.1 b) 1.5 c) 1.9 d) -0.2 **Note: Questions related to **Perceptron** will be asked in this objective (MCQ) format.*	
v.	What happens during the Data Exploration stage? a) We build the AI model b) We create a project plan c) We clean, visualize, and understand the data d) We publish the results	1
vi.	An AI model was developed to predict the prices of smartphones based on their features. The model was tested on a smartphone, and the following predictions were made: Actual Price (₹)= 20,000 and Predicted Price (₹)=19,200 Error rate and accuracy for the smartphone is: a) 0.08 and 0.92 b) 0.15 and 0.85 c) 0.25 and 0.75 d) 0.04 and 0.96	1

SECTION B: SUBJECTIVE TYPE QUESTIONS

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

Answer each question in 20 – 30 words.

Q. 6	List the different types of verbal communication.	2
Q. 7	What is SMART in goal setting?	2

Q. 8	What are the qualities of an entrepreneur?	2
Q. 9	Explain how the Trojan Horse virus works.	2
Q. 10	Explain the importance of education towards sustainable development.	2

Answer any 4 out of the given 6 questions in 20 – 30 words each (2 x 4 = 8 marks)

Q. 11	What is bioethics? List any two principles of bioethics.	2
Q. 12	What is an association rule in machine learning? Explain how association rules help in finding relationships between products using an example.	2
Q. 13	What is anomaly detection in machine learning? Support your answer with a relevant example.	2
Q. 14	What is the need for model evaluation? Why is it important to evaluate a model on unseen data?	2
Q. 15	Differentiate between Object detection and Instance Segmentation.	2
Q. 16	A newspaper company uses an AI model that can automatically sort articles into categories like *Sports*, *Politics*, *Health*, and *Technology*. Identify this NLP application and explain how it helps.	2

Answer any 3 out of the given 5 questions in 50– 80 words each (4 x 3 = 12 marks)

Q. 17	Read the case study below and answer the following questions: A school installs **AI-powered cameras** to monitor student behavior and reduce bullying. The AI can recognize facial expressions and body language, then alert teachers if it detects aggression or stress. Some parents and students support it for safety purposes. Others are concerned about constant surveillance and personal privacy. a) What ethical concerns should be discussed before installing the AI-powered cameras ? b) How can the system avoid violating user privacy? Should the AI be allowed to make decisions without human oversight?	4
Q. 18	You are designing a smart assistant that can recognize objects in pictures – like identifying a dog or a tree. You decide to use a neural network for this task. Explain what a neural network is and how it would process the image using the input layer, hidden layers, and output layer. What role does each layer play in helping the assistant learn and give the correct answer?	4
Q. 19	Imagine you're building a help chatbot for a school website to answer routine queries like "What are the school timings?" or "When will exams be held?"	4

	a) Would you use a rule-based or learning-based approach? b) Explain the approach you have chosen. c) What are the limitations of your chosen approach in this situation? d) Suggest one way to improve the chatbot if students start asking new types of questions that are not covered in the original rules.	
Q. 20	A sentiment analyzer is used to classify responses as positive(1) or negative(0). Out of 500 responses. - True Positives(TP): 150 responses were correctly classified as positive. - False Positives(FP): 100 responses were incorrectly classified as positive. - True Negatives(TN): 200 responses were correctly classified as negative. - False Negatives(FN): 50 responses were incorrectly classified as negative. Calculate accuracy, precision, recall and F1-score.	4
Q. 21	Answer the questions given below- ● Document 1: "The cat sat on the mat" ● Document 2: "The dog is barking" ● Document 3: "Both are good pets" **Questions:** a) Find out the frequency of a word in one document. b) Construct the document frequency table. c) Draw Inverse Document frequency table. d) What is the formula of TFIDF for any word W.	4