CBSE | DEPARTMENT OF SKILL EDUCATION

ARTIFICIAL INTELLIGENCE (SUBJECT CODE - 417)

MARKING SCHEME FOR CLASS X (SESSION 2023-2024)

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.	Self Motivation	Employability Skills NCERT	2	52	**1**
ii.	(c) Hover	Employability Skills NCERT	3	67	**1**
iii.	(a) Both A and R are correct and R is the correct explanation of A	Employability Skills NCERT	4	100	**1**
iv.	(d) Tracking	Employability Skills NCERT	2	60	**1**
v.	(d) Linguistic barrier	Employability Skills NCERT	1	21	**1**
vi.	(c) Affordable and clean energy	Employability Skills NCERT	5	111	**1**
Q. 2	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	(a) Both A and R are correct and R is the correct explanation of A	Facilitator Handbook	1	11	**1**
ii.	(b) Data Privacy	Facilitator Handbook	1	24	**1**
iii.	(a) Both Statement1 and Statement2 are incorrect	Facilitator Handbook	2	40	**1**

iv.	Larger	Facilitator Handbook	2	40	**1**
v.	(c) csv	Facilitator Handbook	4	63	**1**
vi.	(b) Rare word	Facilitator Handbook	6	115	**1**
Q. 3	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	(c) iii and iv	Facilitator Handbook	1	16	**1**
ii.	Data Features/Data	Facilitator Handbook	2	35	**1**
iii.	(b) Target Advertisements	Facilitator Handbook	4	56	**1**
iv.	(b) Object Detection	Facilitator Handbook	5	78	**1**
v.	Smart Bot	Facilitator Handbook	6	105	**1**
vi.	(b) Precision and Recall	Facilitator Handbook	7	127	**1**
Q. 4	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	Deep Learning	Facilitator Handbook	1	21	**1**
ii.	(b) Both Statement1 and Statement2 are incorrect	Facilitator Handbook	7	119	**1**
iii.	(a) Data gathered with respect to stadium, bowlers, opponent team and health is known as Testing Data.	Facilitator Handbook	4	60	**1**
iv.	Three Channels	Facilitator Handbook	5	83	**1**
v.	(b) Sentiment Analysis	Facilitator Handbook	6	100	**1**
vi.	Overfitting	Facilitator Handbook	7	119	**1**
Q. 5	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	(c)Natural Language Processing	Facilitator Handbook	1	22	**1**
ii.	Accuracy	Facilitator Handbook	7	123	**1**
iii.	(c) Pixel	Facilitator Handbook	5	79	**1**
iv.	(b) Grammatical structure of a sentence	Facilitator Handbook	6	106	**1**
v.	(c) Bag of words	Facilitator Handbook	6	112	**1**
vi.	(d) spam filter	Facilitator Handbook	7	126	**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	1. Use simple language 2. Be respectful of others opinions 3. Do not form assumptions on culture, religion or geography 4. Try to communicate in person as much as possible 5. Use visuals 6. Take help of a translator to overcome differences in language (2 marks for any two correct points from the above)	Employability Skills NCERT	1	22	**2**
Q. 7	1. The process of goal setting in your life helps you decide on how to live your life, where you want to be, and how you want to be in the future. 2. It helps you to focus on the end result instead of less important work. 3. This will make you successful in your career and personal life. (2 marks for any one valid justification given above or any relevant answer)	Employability Skills NCERT	2	55	**2**
Q. 8	A Trojan Horse is a type of malware which disguises itself i.e., it appears to be a useful software program but once it reaches a computer it starts behaving like a virus and destroys data. (1 mark for acting like useful program and, 1 mark for the words destroying/corrupting/deleting data) or (only ½ marks will be allotted if only malware/harmful program/virus/ term is mentioned)	Employability Skills NCERT	3	81	**2**
Q. 9	Society is helping entrepreneurs by 1. Creating needs 2. Providing raw material 3. buying/selling of items 4. making money (2 marks for any two valid points)	Employability Skills NCERT	4	85	**2**
Q. 10	1. Use of fertilisers, pesticides,etc for increasing the production of crops.	Employability Skills NCERT	5	103	**2**

	2. Cutting down of forests for personal use such as construction of buildings, factories etc (1 mark for each valid point, or any two relevant answers other than the above)				
Answer any 4 out of the given 6 questions in 20 – 30 words each (2 x 4 = 8 marks)					
Q. 11	1. To provide customized notifications and recommendations. 2. To improve the efficiency and accuracy of the app. (2 marks for any one correct point with explanation)	Facilitator Handbook	Unit 1	25, 26	**2**
Q. 12	Clustering model/Unsupervised learning is used to organize the unlabeled input data into groups based on features. Clustering is an unsupervised learning algorithm which can cluster unknown data according to the patterns or trends identified out of it. The patterns observed might be the ones which are known to the developer or it might even come up with some unique patterns out of it. (1 mark for identifying the name of the algorithm and 1 mark for explanation)	Facilitator Handbook	Unit 2	39	**2**
Q. 13	While accessing data from any of the data sources, following points should be kept in mind: 1. Data which is available for public usage only should be taken up. 2. Personal datasets should only be used with the consent of the owner. 3. One should never breach someone's privacy to collect data. 4. Data should only be taken from reliable sources as the data collected from random sources can be wrong or unusable. 5. Reliable sources of data ensure the authenticity of data which helps in the proper training of the AI model. 6. Data should be relevant to the problem. (any two; 1 mark for each valid point)	Facilitator Handbook	Unit 4	63	**2**
Q. 14	Resolution of an image refers to the number of pixels in an image, across the width and height. For example a monitor resolution of 1280×1024. This means there are 1280 pixels from one side to the other, and 1024 from top to bottom. (1 mark for explanation; 1 mark for example)	Facilitator Handbook	Unit 5	80	**2**

<table>
<tr><td>Q. 15</td><td>Stopwords in the given sentence which should not be removed are:
@, . (fullstop) ,_(underscore) , 123(numbers)

These tokens are generally considered as stopwords, but in the above sentence, these tokens are part of email id. removing these tokens may lead to invalid website address and email ID. So these words should not be removed from the above sentence.
(1 mark for identifying any two stop words from the above, and 1 mark for the valid justification.)</td><td>Facilitator Handbook</td><td>Unit 6</td><td>110</td><td>2</td></tr>
<tr><td>Q. 16</td><td><table><tr><td colspan="2">Confusion Matrix</td><td>Reality</td><td></td></tr><tr><td colspan="2"></td><td>Yes</td><td>No</td></tr><tr><td rowspan="2">Prediction</td><td>Yes</td><td>100</td><td>62</td></tr><tr><td>No</td><td>290</td><td>47</td></tr></table>(½ marks each for mapping the values in the correct section, ½ *4=2 marks)</td><td>Facilitator Handbook</td><td>Unit 7</td><td>122</td><td>2</td></tr>
<tr><td colspan="6">Answer any 3 out of the given 5 questions in 50– 80 words each (4 x 3 = 12 marks)</td></tr>
<tr><td>Q. 17</td><td>When a machine possesses the ability to mimic human traits, i.e., make decisions, predict the future, learn and improve on its own, it is said to have artificial intelligence. In other words, you can say that a machine is artificially intelligent when it can accomplish tasks by itself - collect data, understand it, analyse it, learn from it, and improve it.

Machines become intelligent once they are trained with some data which helps them achieve their tasks. AI machines also keep updating their knowledge to optimise their output. For example, Netflix gives us recommendations on the basis of what we like. Whenever we start liking a new genre, it updates and gives better suggestions.

(2 marks for definition of Artificial intelligence which includes any of the highlighted terms, 2 mark for an example explanation of how machines become intelligent)</td><td>Facilitator Handbook</td><td>Unit 1</td><td>14, 15</td><td>4</td></tr>
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<tr><td></td><td>or
(only 1 mark for any AI machine example which mimic human traits without explanation)</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Q. 18</td><td>The 4Ws Problem canvas helps in identifying the key elements related to the problem. The 4Ws are Who, What, Where and Why
● The “Who” block helps in analysing the people getting affected directly or indirectly due to the problem.
● The “What” block helps us to determine the nature of the problem.
● The “Where” block helps us to look into the situation in which the problem arises, the context of it, and the locations where it is prominent.
● The “Why” block suggests to us the benefits which the stakeholders would get from the solution and how it will benefit them as well as the society

Problem Statement Template
<table><tr><td>Our</td><td>[stakeholders]</td><td>Who</td></tr><tr><td>Have a problem that</td><td>[need]</td><td>What</td></tr><tr><td>When/while</td><td>[context/ location/ situation]</td><td>Where</td></tr><tr><td>An ideal solution would be</td><td>[solution]</td><td>Why</td></tr></table>(½ mark each for explanation of 4w s; 2 marks for drawing the problem statement template with correct words in it or explaining the problem statement template)
or
(1 mark to be allotted if only 4Ws are written without explanation)</td><td>Facilitator Handbook</td><td>Unit 2</td><td>31-34</td><td>4</td></tr>
<tr><td>Q. 19</td><td>The learning based approaches shown in the given figures are Supervised learning and Unsupervised learning.
Figure 1: In a supervised learning model, the dataset which is fed to the machine is labelled. In other words, we can say that the dataset is known to the person who is training the machine only then he/she is able to label the data. A label is some information which can be used as a tag for data.</td><td>Facilitator Handbook</td><td>Unit 2</td><td>37, 38</td><td>4</td></tr>
</table>

	Here, labelled images of dog and cat are fed into the model and trained. The model correctly identifies the given input as dog. Figure 2: An unsupervised learning model works on **unlabelled dataset**. This means that the data which is fed to the machine is random and there is a possibility that the person who is training the model does not have any information regarding it. The **unsupervised learning models are used to identify relationships, patterns and trends out of the data which is fed into it.** It helps the user in understanding what the data is about and what are the major features identified by the machine in it. Here, images of a set of animals are fed into the AI model and the model clusters them based on similar features (1 mark each for identifying each term supervised learning and unsupervised learning; 1 mark per explanation of each term)				
Q. 20	Yes, we might face any challenges if we try to teach computers how to understand and interact in human languages. The possible difficulties are: 1. Arrangement of the words and meaning - the computer has to identify the different parts of a speech. Also, it may be extremely difficult for a computer to understand the meaning behind the language we use. 2. Multiple Meanings of a word - same word can be used in a number of different ways which according to the context of the statement changes its meaning completely. 3. Perfect Syntax, no Meaning - Sometimes, a statement can have a perfectly correct syntax but it does not mean anything. For example, take a look at this statement: *Chickens feed extravagantly while the moon drinks tea.* This statement is correct grammatically but does this make any sense? In Human language, a perfect balance of syntax and semantics is important for better understanding. (1 mark for Yes and 1 mark each for the points on possible difficulties)	Facilitator Handbook	Unit 6	106, 107	**4**

Q. 21	Ans: (i)the total number of wrong predictions made by the model is the sum of false positive and false negative. FP+FN=40+12= 52 (ii) Precision=TP/(TP+FP) =50/(50+40) 50/90 =0.55 Recall=TP/(TP+FN) =50/(50+12) =50/62 =.81 F1 Score = 2*Precision*Recall/(Precision+Recall) =2*0.55*.81/(.55+.81) =.891/1.36 =0.65 (1 marks for part (i) and ½ mark for each formula and ½ mark each for substitution of values in part(ii)) Please note: the mathematical calculations can be ignored	Facilitator Handbook	Unit 7	126,127	**4**