CBSE | DEPARTMENT OF SKILL EDUCATION

ARTIFICIAL INTELLIGENCE (SUBJECT CODE - 417)

MARKING SCHEME FOR CLASS X (SESSION 2022-2023)

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.	(a) Self-motivation	Employability Skills NCERT	Unit 2 Self-Management Skills	**51**	**1**
ii.	(b) driving during rush hour	Employability Skills NCERT	Unit 2 Self-Management Skills	**41**	**1**
iii.	(c) Double clicking	Employability Skills NCERT	Unit 3 Information and communication Technology Skills	**68**	**1**
iv.	(c) It can overheat	Employability Skills NCERT	Unit 3 Information and communication	**78**	**1**

			Technology Skills		
v.	(c) By buying jute from the local farmer and by providing jobs to local women	Employability Skills NCERT	Unit 4 Entrepreneurial Skills	**87**	**1**
vi.	(c) Manages the business	Employability Skills NCERT	Unit 4 Entrepreneurial Skills	**94**	**1**
Q. 2	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	Google Maps, Ola, Uber (any relevant application name with similar functionality can be considered)	Facilitator Handbook	Unit 1	15	**1**
ii.	Naturalist Intelligence	Facilitator Handbook	Unit 1	11	**1**
iii.	(b) (ii) and (iii)	Facilitator Handbook	Unit 1	20	**1**
iv.	(c) Natural Language Processing	Facilitator Handbook	Unit 1	22	**1**
v.	(a) Data Privacy	Facilitator Handbook	Unit 1	25	**1**
vi.	True	Facilitator Handbook	Unit 1	12	**1**
Q. 3	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	Problem Statement Template	Facilitator Handbook	Unit 2	33	**1**
ii.	(b) Hidden layer	Facilitator Handbook	Unit 2	40	**1**
iii.	(d) Neural networks	Facilitator Handbook	Unit 2	41	**1**
iv.	(b) Both i and iv	Facilitator Handbook	Unit 2	34	**1**
v.	(a) 17	Facilitator Handbook	Unit 2	30	**1**
vi.	(c) Clustering	Facilitator Handbook	Unit 2	39	**1**
Q. 4	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	Text Classification	Facilitator Handbook	Unit 6	101	**1**
ii.	(d) Text and Speech	Facilitator Handbook	Unit 6	99	**1**
iii.	Corpus	Facilitator Handbook	Unit 6	108	**1**
iv.	Term Frequency Inverse Document Frequency	Facilitator Handbook	Unit 6	114	**1**
v.	(a) 12	Facilitator Handbook	Unit 6	113	**1**
vi.	Script bot	Facilitator Handbook	Unit 6	105	**1**
Q. 5	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	Prediction	Facilitator Handbook	Unit 7	119	**1**

ii.	Confusion Matrix	Facilitator Handbook	Unit 7	122	**1**
iii.	(c) False Negative	Facilitator Handbook	Unit 7	121	**1**
iv.	(b) Precision and Recall	Facilitator Handbook	Unit 7	127	**1**
v.	(d) The training accuracy and test accuracy both are low	Facilitator Handbook	Unit 7	119	**1**
vi.	(a) Accuracy	Facilitator Handbook	Unit 7	123	**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	In SMART goals, A refers for Achievable, it means breaking down big goals into smaller parts will make the goal achievable. For example Bigger Goal: "I want to become a teacher in my school." Breaking it into smaller goals: Complete higher secondary Complete Graduation Complete B.Ed. Apply for jobs in the teaching field *(1 mark for identification; 1 mark for explanation)*	Employability Skills NCERT	Unit 2 Self-Management Skills	**Page 55, 56**	**2**
Q. 7	The four steps of effective time management which Sameera must have followed are: (i) Organise (ii) Prioritise (iii) Control (iv) Track *(½ mark for every step, ½ * 4 =2)*	Employability Skills NCERT	Unit 2 Self-Management Skills	**60**	**2**
Q. 8	Two methods to protect our data on the computer: 1. Use passwords to login to your computer. 2. Install Anti-virus and Firewall 3. Encrypt Data 4. Secure sites *(1 mark for each correct method, 1*2=2)*	Employability Skills NCERT	Unit 3 Information and communication Technology Skills	**81, 82**	**2**

Q. 9	I. Fulfill Customer Needs II. Use Local Materials III. Help Society IV. Create Jobs V. Sharing of Wealth VI. Lower Price of Products *(1 mark for each correct point, 1*2=2)*	Employability Skills NCERT	Unit 4 Entrepre-neurial Skills	**86, 87**	**2**
Q. 10	This stage is the Survive stage of an entrepreneur's career process. In this stage, even if there are many entrepreneurs in the market, the new entrepreneur has to remain in a competitive market. *(1 mark for mentioning the stage; 1 mark for correct explanation)*	Employability Skills NCERT	Unit 4 Entrepre-neurial Skills	**100**	**2**
Answer any 4 out of the given 6 questions in 20 – 30 words each (2 x 4 = 8 marks)					
Q. 11	Any machine that has been trained with data and can make decisions/predictions on its own can be termed as AI. Eg:The bot or the automation machine is not trained with any data is not an AI while a chatbot that understands and processes human language is an AI. (*1 mark for correct explanation; ½ mark for example of AI; ½ mark for example of not AI*)	Facilitator Handbook	Unit 1	**16, 17**	**2**
Q. 12	In the given scenario, we are concerned about the bias. When we talk about a machine, we know that it is artificial and cannot think on its own. It can have intelligence, but we cannot expect a machine to have any biases of its own. Any bias can transfer from the developer to the machine while the algorithm is being developed. *(1 mark for mentioning the term bias; 1 mark for the correct explanation)*	Facilitator Handbook	Unit 1	**26**	**2**

Q. 13	Steps of AI project life cycle: 1. Data Acquisition 2. Data Exploration 3. Modelling 4. Evaluation *(½ mark for mentioning each stage, ½ *4=2)*	Facilitator Handbook	Unit 2	**29**	**2**
Q. 14	Stemming Lemmatization happily happi happy Process that takes longer time for execution is lemmatization *(½ marks each for identifying the correct stem and lemma; 1 mark for identifying the correct process)*	Facilitator Handbook	Unit 6	**110, 111**	**2**
Q. 15	Bag of words gives us two things: 1. A vocabulary of words for the corpus 2. The frequency of these words (number of times it has occurred in the whole corpus) *(1 mark for each point)*	Facilitator Handbook	Unit 6	**112**	**2**
Q. 16	Let us take each of the factor into consideration at once, If precision is considered, FN cases will not be taken into account, so it will be of great loss as if the machine will predict there will be no heavy rain, but if the rain occurred, it will be a big monetary loss due to damage to crops. If only recall is considered, then FP cases will not be taken into account. This situation will also cause a big amount of loss, as all people of the village are dependent on farmers for food, and if the model predicts there will be heavy rain and the farmers may not grow crops, it will affect the basic needs of the people. Hence F1 Score is the best suited parameter to test this AI model, which is the balance between Precision and Recall. *(1 mark for identifying the term F1 score; 1 mark for relevant explanation)*	Facilitator Handbook	Unit 7	**126, 127**	**2**
Answer any 3 out of the given 5 questions in 50– 80 words each (4 x 3 = 12 marks)					
Q. 17	All humans possess 9 types of intelligence but at different levels. They are: 1. Mathematical Logical Reasoning: ability to regulate, measure, and understand numerical symbols, abstraction and logic. 2. Linguistic Intelligence: Language processing skills both in terms of	Facilitator Handbook	Unit 1	**11**	**4**

	understanding or implementation in writing or verbally. 3. Spatial Visual Intelligence : ability to perceive the visual world and the relationship of one object to another. 4. Kinesthetic Intelligence : ability that is related to how a person uses his limbs in a skilled manner. 5. Musical Intelligence : ability to recognize and create sounds, rhythms, and sound patterns. 6. Intrapersonal Intelligence : Describes how high the level of self-awareness someone has is. Starting from realizing weakness, strength, to his own feelings. 7. Existential Intelligence : An additional category of intelligence relating to religious and spiritual awareness. 8. Naturalist Intelligence : An additional category of intelligence relating to the ability to process information on the environment around us. 9. Interpersonal intelligence : ability to communicate with others by understanding other people's feelings & influence of the person. *(½ mark for the naming the intelligence; ½ mark for the explanation of the same; (½ + ½) * 4 = 4)*				
Q. 18	Artificial Intelligence (AI) refers to any technique that enables computers to mimic human intelligence i.e., make decisions, predict the future, learn and improve on its own. With respect to the type of data fed in the AI model, AI models can be broadly categorised into three domains: 1. Data sciences 2. Computer vision 3. Natural Language Processing Data Science takes input in the form of numeric and alphanumeric data. Computer Vision takes input in the form of images and videos. Natural Language Processing takes input in the form of text and speech. *(1 mark for definition of AI; ½ mark each for the names of the domains; ½ mark each for the type of data input to domains)*	Facilitator Handbook	Unit 1	**21**	**4**

Q. 19	Neural networks are loosely modelled after how neurons in the human brain behave. The features of a neural network are : 1. They are able to extract data features automatically without needing the input of the programmer. 2. A neural network is essentially a system of organizing machine learning algorithms to perform certain tasks. 3. It is a fast and efficient way to solve problems for which the dataset is very large, such as in images. *(1 mark for how neural networks are modelled; 1 mark each for relevant feature of neural network)*	Facilitator Handbook	Unit 2	**40, 41**	**4**
Q. 20	**1. Tokenisation** Akash, and, Ajay, are, best, friends Akash, likes, to, play, football, but, Ajay, prefers, to, play, online, games **2. Removal of stopwords** Akash, Ajay, best, friends Akash, likes, play, football, Ajay, prefers, play, online, games **3. converting text to a common case** akash, ajay, best, friends akash, likes, play, football, ajay, prefers, play, online, games **4. Stemming/Lemmatisation** akash, ajay, best, friend akash, like, play, football, ajay, prefer, play, online, game *(1 mark for each step; 1*4=4)*	Facilitator Handbook	Unit 6	**108 - 111**	**4**
Q. 21	(i) TP=60, TN=10, FP=25, FN=5 60+25+5+10=100 total cases have been performed (ii) **(Note: For calculating Precision, Recall and F1 score, we need not multiply the formula by 100 as all these parameters need to range between 0 to 1)** Precision =TP/(TP+FP) =60/(60+25) =60/85 =0.7	Facilitator Handbook	Unit 7	**124-127**	**4**

	Recall=TP/(TP+FN) =60/(60+5) =60/65 =0.92 F1 Score=2*Precision*Recall/ (Precision+Recall) =2*0.7*0.92/(0.7+0.92) =0.79 *(1 mark for total number of cases; 1 mark each for the calculation of precision, recall and F1 score)*				