

SUPERNOVA-LEARNPYTHON
CLASS X

SAMPLE PAPER - I

ARTIFICIAL INTELLIGENCE (SUBJECT CODE – 417)

Max. Time: 2 Hours

Max. Marks: 50

General Instructions:

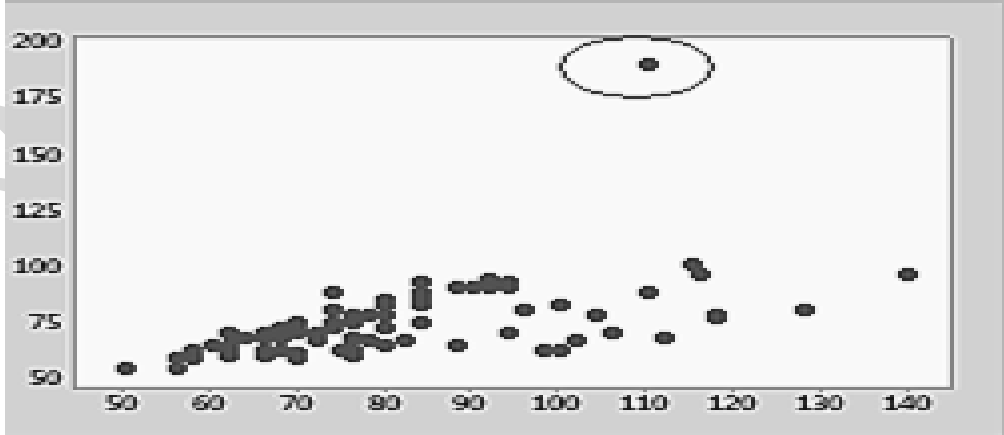
1. Please read the instructions carefully.
2. This Question paper consists of 21 questions in two sections: Section A & Section B.
3. Section A has Objective type questions whereas Section B contains Subjective type questions.
4. Out of the given (5 + 16 =) 21 questions, a candidate has to answer (5 + 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.

***NOTE: This question paper contains 6 pages.**

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.	Rohit, when leaving from his friend's house is bidding goodbye by waving his hands. Which type of non-verbal communication is used by Rohit? a) Expression b) Body language c) Gesture d) All the above	1
ii.	Shalini, was preparing for her final board exams. She feared that she will not get good marks in English because of her poor memory. This made her nervous before the exam and she actually got poor marks in the exam. Which self-management skill is clearly visible in the given statement?	1
iii.	Assertion (A): An Entrepreneur is always trying new things. Reason(R) : He/she does this to increase their importance and income. a) Both A and R are correct and R is the correct explanation of A b) Both A and R are correct but R is NOT the correct explanation of A c) A is correct but R is not correct d) A is not correct but R is correct	1
iv.	What keys do you use to copy something? a) Ctrl + c b) Ctrl + v c) Ctrl + x d) Ctrl + a	1
v.	Identifying our strengths and weakness, helps us to be e) Self-motivated f) Self-regulated g) Self-aware h) Emotionally intelligent	1


vi.	How many sustainable development goals are given by the United Nations? a) 18 b) 17 c) 15 d) 20	1
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Q.2	Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)	
i.	A program will often translate the English term 'nurse' using a female gendered word, and render 'doctor' as a male noun. Which terminology best suits this? a) Data privacy b) AI bias c) AI ethics d) AI access	1
ii.	In _____, the machine is trained with huge amounts of data which helps it in training itself around the data. a) Supervised learning b) Deep learning c) Classification d) None of the above	1
iii.	A neural network is divided into multiple layers and each layer is further divided into several blocks called_____. a) Terminal b) Connector c) Node d) All the above	1
iv.	The _____ chart is best suited to show proportions and percentages between categories, by dividing a circle into proportional segments.	1
v.	Clustering is an example of a) Supervised learning model b) Rule based model c) Unsupervised learning model d) Reinforced learning model	1
vi.	Observe the given graph and fill in the blank:  The data point existing out of the range is called _____.	1

Q.3	Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)	
i.	A professional lawyer, will have the following type of intelligence used in his profession a) Spatial Intelligence b) Kinesthetic Intelligence c) Naturalist Intelligence d) Linguistic Intelligence	1
ii.	Which block of the 4Ws problem canvas focuses on the problem's context, circumstance or location? a) What b) Who c) Where d) Why	1
iii.	DealTime, a price comparison website is an example of the following domains of AI a) Computer Vision b) Data Science c) Natural Language Processing d) All the above	1
iv.	Image _____ refers to the quality and size of an image in terms of the number of pixels it contains, typically as "width x height"	1
v.	One of the AI applications is AI Chatbot. What may a chatbot be? a) Audio-based b) Video-based c) Text-based d) All the above	1
vi.	Recall is the measure of a) Fraction of positive cases that are correctly identified. b) Fraction of negative cases that are correctly identified. c) Fraction of positive cases that are not identified. d) Fraction of negative cases that are not identified.	1
Q.4	Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)	
i.	The Neural network layer where no processing occurs is the _____.	1
ii.	Statement1: An AI based prediction model is said to be more efficient, if it makes more number of correct prediction. Statement2: Reality is the output which is given by the machine. a) Both Statement1 and Statement2 are correct b) Both Statement1 and Statement2 are incorrect c) Statement1 is correct but Statement2 is incorrect d) Statement1 is incorrect but Statement2 is correct	1
iii.	The process of detecting instances of the objects, giving them a category and then giving each pixel a label on the basis of that. a) Object detection b) Classification c) Localisation d) Instance segmentation	1
iv.	What is the role of modelling in an NLP based AI model? a) Modelling in NLP helps in processing of AI model b) Modelling is required to make an AI model c) In NLP, modelling requires data pre-processing only after which the data is fed to the machine. d) Modelling is used in simplification of data acquisition	1
v.	How many tokens are there in the given sentence? <i>In CBT, we learn to decipher the lies we are undermining ourselves with-based on the bias embedded in the things we say.</i>	1
vi.	The approach used by companies to identify opinions and sentiment online to help them understand what customers think about their products and services. Name the approach.	1

Q.5 Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)		
i.	Ayush, a student of class XII has developed a chatbot that can predict the salary of any employee based on his previous salaries. He is now collecting data for improving the accuracy level of his chatbot, which type of dataset needs to be collected more for better prediction of employee salary? a) Training set b) Testing set c) Validation set d) Equal volume of testing and training set.	1
ii.	_____ is used to record the result of comparison between the prediction and reality. It is not an evaluation metric but a record which can help in evaluation.	1
iii.	The words which do not add much meaning to a sentence and can be safely ignored without scarifying the meaning of the sentence is _____ a) Rare words b) Stop words c) Tokens d) Lemma	1
iv.	Monal was learning the conditions that make up the confusion matrix. She came across a scenario in which the machine that was supposed to predict a bird was always predicting not a bird. What is this condition called? a) False Positive b) True Positive c) False Negative d) True Negative	1
v.	The _____ allows us to understand the prediction results. a) Over fitting b) Problem scoping c) Data acquisition d) Confusion matrix	1
vi.	Which of the following statements is true for the term Evaluation? a) Helps in classifying the type and genre of a document. b) It helps in predicting the topic for a corpus. c) Helps in understanding the reliability of any AI model d) Process to extract the important information out of a corpus.	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.**

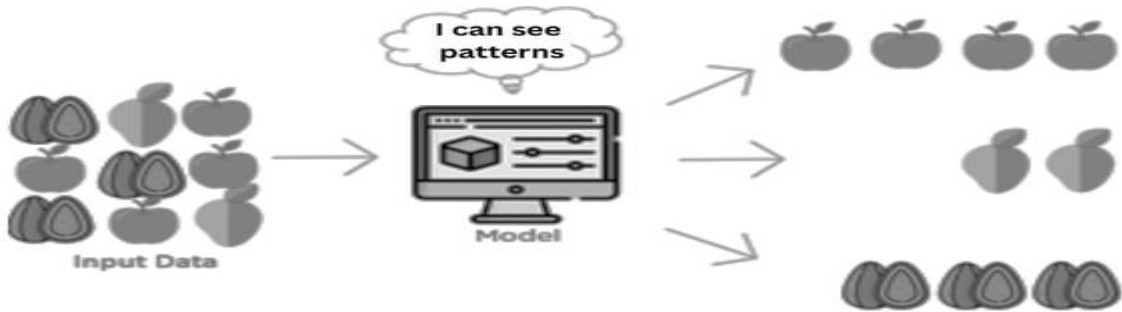
Q. 6	 The symbol shown represents “No Parking zone”. What type of communication uses such symbols and what is the advantage of using that form of communication?	2
Q. 7	Why do we need to manage stress?	2
Q. 8	“Security break is leakage of information stored in a computer”. What are the various ways in which a security break can happen?	2
Q. 9	What is the difference between a misconception and reality? Give an example.	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	Give one example for each of the following domains of AI:	2
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	a) Computer Vision b) Natural Language	
Q. 12	Mishra, a student of class X is observing that as the exams are nearing, he himself and all his friends are tired and sleepy. The school counselor says this is due to inadequate sleep and outdoor activity. Help Mishra to define the problem statement with the help of 4W problem canvas.	2
Q. 13	What are the steps involved in collecting data using web scraping?	2
Q. 14	what is the output colour when you put R=G=B=255? What is the output colour when you put R=G=B=0?	2
Q. 15	Identify the stem word and lemma for the following tokens? Healed, Studies, Downloading, stressed	2
Q. 16	Draw the confusion matrix for the following data: <ul style="list-style-type: none"> The number of real positive cases, predicted to be positive: 180 The number of real negative cases, predicted to be positive: 30 Total number of positive cases: 210 Total number of negative cases: 90 	2

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

Q. 17	Sandeep is amused, when his friend Rishab explains him how AI technologies can be integrated with non-AI technologies. Help him understand this integration with the help of 2 examples.	4													
Q. 18	What do you understand by AI, ML & DL? How are they different from each other?	4													
Q. 19	Identify the type of learning based approaches in the figures given below and also explain its types. 	4													
Q. 20	Through a step-by-step process, perform text normalization for the given corpus: Raj and Vijay are best friends. They play together with other friends. Raj likes to play football but Vijay prefers to play online games. Raj wants to be a footballer. Vijay wants to become an online gamer.	4													
Q. 21	An AI model made the following sales prediction for a new mobile phone which they have recently launched: <table border="1" data-bbox="365 1554 1307 1711"> <thead> <tr> <th colspan="2" rowspan="2">Confusion matrix</th> <th colspan="2">Reality</th> </tr> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <th rowspan="2">Predicted</th> <th>Yes</th> <td>30</td> <td>45</td> </tr> <tr> <th>No</th> <td>10</td> <td>12</td> </tr> </tbody> </table> <p>a) How many total tests have been performed in the above scenario? b) Calculate precision, recall and F1 score.</p>	Confusion matrix		Reality		Yes	No	Predicted	Yes	30	45	No	10	12	4
Confusion matrix				Reality											
		Yes	No												
Predicted	Yes	30	45												
	No	10	12												