

SUPERNOVA-LEARNPYTHON**CLASS X****ARTIFICIAL INTELLIGENCE (SUBJECT CODE 417)**

Time: 2 Hours

Maximum 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):**
 - (a) This section has 5 questions.
 - (b) Marks allotted are mentioned against each question/part.
 - (c) There is no negative marking.
 - (d) Do as per the instructions given.
7. **SECTION B – SUBJECTIVE TYPE QUESTIONS (26 MARKS):**
 - (a) This section has 16 questions.
 - (b) A candidate has to do 10 questions.
 - (c) Do as per the instructions given.
 - (d) Marks allotted are mentioned against each question/part.

SECTION A: OBJECTIVE TYPE QUESTIONS**1. Answer any 4 out of the given 6 questions on Employability Skills.****(1 x 4 = 4 marks)**

- (i) Which of the following software acts as an interface between the user and the computer?
 - (a) Operating System
 - (b) MS Excel
 - (c) Impress
 - (d) Digital Documentation
- (ii) A student has difficulty in expressing themselves in a class discussion due to anxiety. This is an example of _____.
 - (a) Perception barrier
 - (b) Emotional barrier
 - (b) Cultural barrier
 - (d) Clarity barrier
- (iii) _____ best characterizes sustainable development.
 - (a) Ensuring the well-being of future generations
 - (b) Prioritizing only our own interests
 - (c) Balancing the well-being of ourselves and future generations
 - (d) Focusing on the welfare of all
- (iv) Geetika has prepared a timetable to achieve her goal. This skill is known as _____.
 - (a) Self-awareness
 - (b) Responsibility
 - (c) Adaptability
 - (d) Time management
- (v) A customer comes to Naman's grocery outlet and starts expressing dissatisfaction about an item. Instead of getting angry, Naman listens to what his customer is saying. He is known for his _____.
 - (a) Hard-working attitude
 - (b) Confidence level
 - (c) Patience
 - (d) Willingness to embrace new ideas
- (vi) _____ is a network security device that acts as a barrier between a trusted internal network and untrusted external networks.

2. Answer any 5 out of the given 6 questions.**(1 x 5 = 5 marks)**

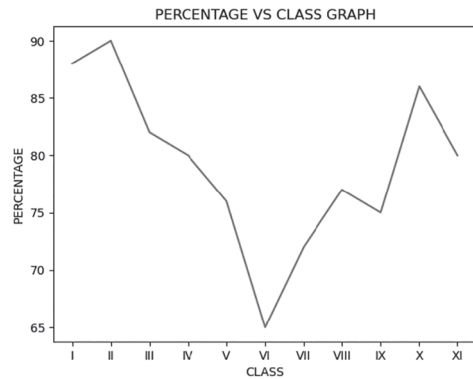
- (i) Which of the following is a fully enabled AI machine?
- (a) A machine that gets trained first on the training data and then optimizes itself according to its own experiences
 - (b) A machine that relies on a set of predefined rules
 - (c) A machine that works smartly without any past data
 - (d) A machine that has some level of autonomy or adaptivity
- (ii) Name the 4Ws of problem canvas under the Problem Scoping stage of the AI Project Cycle. Choose the correct option:
- (a) Who, What, Where, Why
 - (b) Who, What, Where, When
 - (c) Who, When, Why, Whom
 - (d) Who, What, Why, Whose
- (iii) What is the main focus of Data Science?
- (a) Collecting data from various sources
 - (b) Analyzing and interpreting the collected data
 - (c) Developing databases for record maintenance
 - (d) Only implementing artificial intelligence in data analysis
- (iv) Which evaluation metric is suitable for detecting a rare and life-threatening disease in medical diagnosis.
- (a) Precision
 - (b) Recall
 - (c) F1 Score
 - (d) Accuracy
- (v) _____ is a measure of number of pixels that make up the image.
- (vi) _____ allows us to understand the Predicted results.
- (a) Overfitting
 - (b) Problem scoping
 - (c) Confusion Matrix
 - (d) Data Acquisition

3. Answer any 5 out of the given 6 questions.**(1 x 5 = 5 marks)**

- (i) Which of the following is not an application of NLP?
- (a) Voice assistant
 - (b) Siri
 - (c) Text generation
 - (d) Copying text
- (ii) Identify the incorrect statement from the following options:
- (a) Data Science is one of the domains of AI.
 - (b) AI models can be broadly categorized into four domains.
 - (c) Data Science is used in price comparison websites for comparing prices using machine learning algorithm.
 - (d) The information extracted through Data Science can be used to make decisions.

Questions (iii) and (iv) are Case-study Based

Case: Palak is a computer science student and she implements her learning in daily life. Her younger brother Parth is studying in Class XII. Palak decided to plot a graph using Python to predict his Class XII marks using machine learning.



- (iii) Which Python library has been used to plot the given graph?
- (a) matplotlib, pandas (b) numpy, statistics
(c) cv2, pandas (d) nltk, matplotlib
- (iv) In which class did Parth score the highest percentage?
- (a) X (b) XI
(c) II (d) I
- (v) Irrelevant training data leads to poor performance and unreliable outcomes. (True/False)
- (vi) Which NLP model helps in extracting features out of the text that can be helpful in machine learning algorithms?
- (a) Bag of Words
(b) Big Words
(c) Best Words
(d) All of these

4. Answer any 5 out of the 6 given questions.

(1 x 5 = 5 marks)

- (i) Inayra is talking about various stages of AI project cycle. Regarding a stage, she says that in this we collect data for the project. Which stage of the AI project cycle is she talking about?
- (a) Problem Scoping (b) Data Exploration
(c) Data Acquisition (d) Data Modelling
- (ii) In which field does data science enable an advanced level of personalization treatment through research?
- (a) Genetics & Genomics (b) Internet Search
(c) Fraud and Risk Detection (d) Airline Route Planning
- (iii) Which of the following is not a task of computer vision?
- (a) Guest Recognition (b) Airline Route Plan
(c) Attendance System (d) Snapchat Filters
- (iv) _____ can be defined as the measure of balance between precision and recall.
- (a) Recall (b) Accuracy
(c) Precision (d) F1 Score
- (v) The term used for the whole textual data from all the documents altogether is _____.
- (vi) A model will simply remember the whole training set and will therefore always predict the correct label for any point in the training set. This is known as _____.
- (a) Overfitting (b) Perfect Fit
(c) Over Remembering (d) Underfitting

5. Answer any 5 out of the 6 given questions.**(1 x 5 = 5 marks)**

- (i) In computer vision, _____ function is used to display an image in RGB color format.
- (a) imshow() (b) display()
(c) print() (d) All of these
- (ii) Which of the following functions is used for statistical analysis?
- (a) min(), max(), head() (b) min(), max(), avg()
(c) min(), max(), info() (d) mean(), mode(), median()
- (iii) _____ is a term used for any word, number or special character occurring in a sentence.
- (iv) _____ is an NLP technique used to identify and classify named entities in a text.
- (v) _____ is defined as the percentage of true positive cases to all the predicted positive cases.
- (vi) Which of the following refers to the ability to perceive the visual world and understand the relationship between different objects?
- (a) Kinesthetic Intelligence (b) Linguistic Intelligence
(c) Spatial Visual Intelligence (d) Mathematical Logical Reasoning

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.**

6. Enumerate the different ways available to protect your data from theft and viruses.
7. What is Visual Communication?
8. List four positive effects of entrepreneurship on society.
9. Briefly define the terms:
- (a) Refuse (b) Upcycle
10. Differentiate between Eustress and Distress?

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

11. What is Data Visualization? Name any two Python libraries which are used for visualizing data.
12. What do you understand by TF-IDF? Write its formula.
13. Why is evaluation important? Explain.
14. Mention any four applications of AI in computer vision.
15. What are the two different approaches for AI modelling? Define them.
16. Write any three main concerns about AI ethics.

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

17. Differentiate between Classification and Regression algorithms with the help of their respective graphs.
18. Are Artificial Intelligence (AI), Machine Learning (ML), Deep Learning (DL) and Data Science (DS) related to each other? If yes, how?
19. What is NLTK? Write any three features.
20. Calculate Accuracy, Precision, Recall and F1 Score for the following Confusion Matrix on Heart Attack Risk. Also suggest which metric would not be a good evaluation parameter here and why?

The Confusion Matrix	Reality: 1	Reality: 0
Prediction: 1	50	20
Prediction: 0	10	20

The Confusion Matrix	Reality: 1	Reality: 0	
Prediction: 1	50	20	70
Prediction: 0	10	20	30
	60	40	100

21. What do you mean by AI Project Cycle? What are the stages involved in AI project cycle? Explain briefly.