

**SUPERNOVA-LEARNPYTHON****CLASS X****SAMPLE PAPER - 4**

Time: 2 Hours

**ARTIFICIAL INTELLIGENCE (SUBJECT CODE 417)**

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) 4R and 1U stand for
 

(a) Reduce, Refuse, Reuse, Recycle, Unused	(b) Reduce, Refuse, Reuse, Repeat, Upcycle
(c) Reduce, Repeat, Reuse, Recycle, Unused	(d) Reduce, Refuse, Reuse, Recycle, Upcycle
- (ii) \_\_\_\_\_ is the founder of boAt, an electronic product-based company.
 

(a) Aman Gupta	(b) Peyush Bansal
(c) Namita Thapar	(d) Vineeta Singh
- (iii) A student named Prachi is a district-level gymnast and devotes 4-5 hours in practising. Since her final examinations are going to start soon, she has started feeling distressed. What would be the most suitable method of managing stress for Prachi?
 

(a) Engaging with leisure activities	(b) Relaxing and taking 10-12 hours of sleep
(c) Organizing, prioritizing and managing tasks	(d) Keep on practising gymnastics
- (iv) A friendly gesture in one culture could be offensive in another. (True/False)
- (v) \_\_\_\_\_ are small data files stored on your computer by the websites you visit.
 

(a) Firewalls	(b) Cookies
(c) Temporary files	(d) Files
- (vi) A firewall is a network security device or software that acts as a barrier between a trusted internal network and untrusted external networks. (True/False)

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

- (i) Which machine learning technique is used to build the Snakes and Ladders game?
 

(a) Regression	(b) Classification
(c) Clustering	(d) Reinforcement Learning

- (ii) Vishwanathan Anand is a great Indian chess grandmaster. What type of intelligence does he possess?
- (a) Naturalistic (b) Intrapersonal  
(c) Visual-Spatial (d) Logical-Mathematical
- (iii) Deep Learning is a subset of
- (a) Artificial Intelligence (b) Machine Learning  
(b) Computer Vision (d) Natural Language Processing
- (iv) Aspect ratio in computer vision refers to proportional relationship between the \_\_\_\_\_ and \_\_\_\_\_ of an object or image.
- (a) Width, Height (b) Width, Pixels  
(c) Height, Intensity (d) Length, Breadth
- (v) NER stands for
- (a) Named Entities Recognition (b) Norms & Entities Recognition  
(c) Named Entity Recognition (d) Names & Entities Recognition
- (vi) Which of the following technologies has been created using machine learning?
- (a) Spam e-mail filtering (b) Recommendation systems  
(c) Weather predictions (d) All of these

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

- (i) \_\_\_\_\_ is the process of dividing an image into different regions based on certain characteristics.
- (a) Image Classification (b) Image Localization  
(c) Image Segmentation (d) Image detection
- (ii) The Sentiment Intensity Analyzer calculates a sentiment score ranging from \_\_\_\_\_ to \_\_\_\_\_.
- (iii) If True Positive (TP)=90, True Negative (TN)=880, False Positive (FP)=20 and False Negative (FN)=10, then Accuracy will be
- (a) 0.97 or 97% (b) 0.98 or 98%  
(c) 0.96 or 96% (d) None of these
- (iv) AI Bias simply means
- (a) Accessibility of AI to all  
(b) Unfair predictions due to discrimination in training data  
(c) Risk of data security  
(d) Increasing risk of cyber attacks
- (v) \_\_\_\_\_ represents transparency or opacity of each pixel.
- (a) Texture (b) Pixel Value  
(c) Resolution (d) Alpha Channel
- (vi) \_\_\_\_\_ words are commonly used words which occur very frequently and do not contribute much in a text.

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

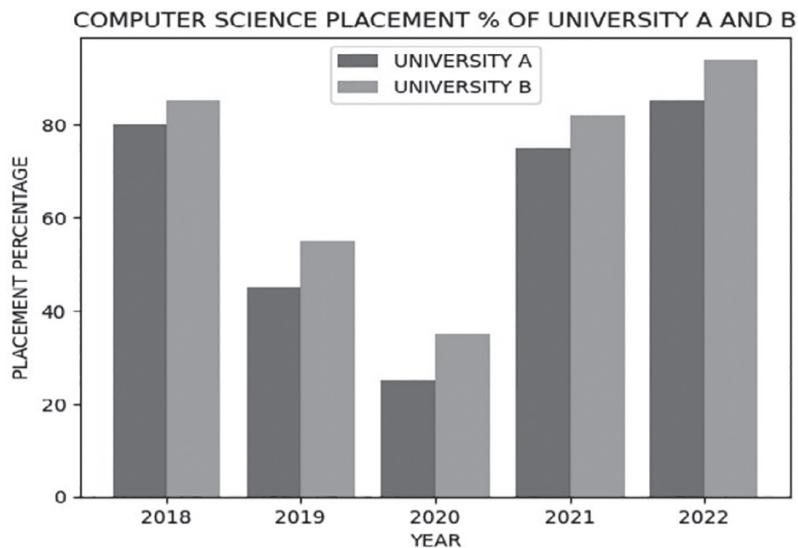
- (i) What would be the output if Lemmatization and Stemming technique is applied on the word "explore"?
- (a) explore, explor (b) explor, explore  
(b) explored, explores (d) None of these
- (ii) Underfitting condition occurs when training performance is high and test performance is low. (True/False)
- (iii) Which of the following statements is false for script-based chatbots?
- (a) It is a pre-programmed chatbot. (b) It uses *if-else* statements more often.  
(c) It uses decision tree like structures. (d) Its example includes generative chatbots.

- (iv) Which evaluation metrics should be used when classes are balanced and both positive and negative instances are equally important?
- (a) Precision (c) Recall  
(c) Accuracy (d) F1 Score
- (v) \_\_\_\_\_ helps to evaluate how well a model works with an independent dataset by partitioning the available data into multiple smaller parts.
- (a) Cross-Validation (b) Deployment  
(c) F1 Score (d) Confusion Matrix
- (vi) Dimensionality Reduction in machine learning refers to a technique which reduces the number of rows from data. (True/False)

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

**(1 x 5 = 5 marks)**

CASE: Surbhi and Shreya collected Computer Science Engineering course placement data of the last 5 years to visualize and find a conclusion.



- (i) Surbhi and Shreya are \_\_\_\_\_ as they are directly or indirectly impacted by the problem.
- (a) Developers (b) Coders  
(c) Students (d) Stakeholders
- (ii) What is/are the python libraries used to make this graph?
- (a) matplotlib, nltk (b) matplotlib, cv2  
(b) matplotlib, numpy (d) matplotlib
- (iii) In which of the following years was the placement percentage maximum and minimum?
- (a) 2022, 2020 (b) 2021, 2020  
(c) 2020, 2022 (d) 2020, 2021
- (iv) What is the average placement percentage of University A since the last 5 years?
- (a) 62% (b) 72%  
(c) 65% (d) 60%
- (v) What are the other visualization tools which make visualization attractive and easier?
- (a) PowerBI (b) Tableau  
(c) Datawrapper (d) All of these
- (vi) On the basis of the above graph, University \_\_\_\_\_ would be the best choice for taking admission.

**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. "A computer virus acts like a weapon." Do you agree? Justify your answer.
7. "Adesh, a tech fresher, doesn't like any involvement or suggestions in his project and likes to work independently. During COVID-19, the company culture changed and asked their employees to work from home. Being a fresher, Adesh started facing technical issues." What would be your suggestion to Adesh on working independently?
8. "Symbolically encoded paintings on stones, coins, caves, monuments and other historical events provide information about the past." What type of communication was used by our ancestors to convey their messages to future generations?
9. What do you understand by the terms Green Economy and Green Consumer?
10. What roles and functions does an entrepreneur undertake in the realm of business and innovation?

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

11. Differentiate between AI and Non-AI technology.
12. What is an RGB image? Why is it called so?
13. Write one function of each library—numPy and pandas.
14. Differentiate between supervised machine learning and unsupervised machine learning.
15. What do you understand by the Evaluation and Deployment stage in AI project cycle?
16. What is Tokenization? Count the number of tokens in the following sentence:  
If you fail, never give up because FAIL means "First Attempt in Learning."

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

17. A 52-year-old man named Satya, a partially blind writer, writes short stories and poems in rural newspapers and magazines. He is dependent on villagers for his work. Suggest some NLP-based techniques so that he can continue his work independently.
18. What do you understand by the Data Exploration stage in AI project cycle? Briefly explain any 3 methods of data exploration techniques.
19. Explain 4Ws Canvas in AI project cycle.
20. Consider the following case study:  
This study aims to assess the extent of digitalization over the past few years.  
Reality: In a grocery shop, on a particular day, a total of 750 people visited and purchased their daily essentials. Out of these, 600 people paid via online mode and the rest made their payments through cash.  
Model Predictions: An AI model predicts that 650 people made UPI/online transactions while the rest paid cash.  
Create a Confusion Matrix based on the above situation and calculate F1 Score.
21. "A great leader is recognized for their exceptional skill in making decisions." Is it correct to say that AI has exceptional qualities in the decision-making process? How does AI make decisions?