

**KENDRIYA VIDYALAYA SANGATHAN, LUCKNOW REGION FIRST
PRE-BOARD EXAMINATION (2024-25)
CLASS – X**

SUBJECT – ARTIFICIAL INTELLIGENCE (417)

Max. Time: 2 Hours

Max. Marks: 50

General Instructions:

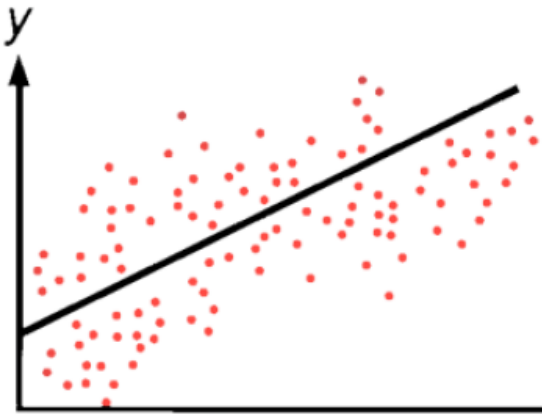
- Please read the instructions carefully.
- This Question Paper consists of **21 questions** in two sections: **Section A & Section B**.
- **Section A** has **Objective type questions** whereas **Section B** contains **Subjective type questions**.
- **Out of the given (5 + 16 =) 21 questions, a candidate has to answer (5 + 10 =) 15 questions in the allotted (maximum) time of 2 hours.**
- All questions of a particular section must be attempted in the correct order.
- **SECTION A - OBJECTIVE TYPE QUESTIONS (24 MARKS):**
 - This section has 05 questions.
 - Marks allotted are mentioned against each question/part.
 - There is no negative marking.
 - Do as per the instructions given.
- **SECTION B – SUBJECTIVE TYPE QUESTIONS (26 MARKS):**
 - This section has 16 questions.
 - A candidate has to do 10 questions.
 - Do as per the instructions given.
 - Marks allotted are mentioned against each question/part.

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.	_____ is the final component in the process of communication as it defines the response given by the receiver to the sender. (a) Response (b) Request (c) Feedback (d) Notice	1
ii.	Sameer gets up at 6 am and goes to his hobby classes. Then he comes home and finishes her homework before going to school. He does this all by himself. No one tells him to do it. This is an example of (a) Self-motivation (b) External motivation (c) Both self and external motivation (d) Not any specific type of motivation	1
iii.	Assertion (A): An entrepreneur takes risks. Reason (R): An entrepreneur is self-confident. (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.	_____ act as an interface between the user and the computer. (a) Operating System (b) MS Excel (c) Impress (d) Digital Documentation	1
v.	_____ refers to recruitment, employment, selection, training, development and compensation of the employees with an organization. (a) Entrepreneurs (b) Management (c) Human Resource Management (d) Employer	1
vi.	Choose the option which is not a sustainable development goal according to United Nations. (a) Clean Water and Sanitation (b) Gender Equality (c) Population (d) Reduced Inequalities	1
Q. 2	Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)	
i.	Choose the five stages of AI project cycle in correct order: (a) Evaluation -> Problem Scoping -> Data Exploration -> Data Acquisition –> Modelling (b) Problem Scoping -> Data Exploration -> Data Acquisition -> Evaluation –> Modelling (c) Data Acquisition -> Problem Scoping -> Data Exploration -> Modelling –> Evaluation (d) Problem Scoping -> Data Acquisition -> Data Exploration -> Modelling-> Evaluation	1
ii.	Online Company had been working on a secret AI recruiting tool. The machine-learning specialists uncovered a big problem: their new recruiting engine did not like women. The system taught itself that male candidates were preferable. It penalized resumes that included the word “women”. This led to the failure of the tool. This is an example of- (a) Data Privacy (b) AI access (c) AI Bias (d) Data Exploration	1
iii	Spam filter is an application of _____. (a) Natural Language Processing (b) Computer Vision (c) Data Science (d) Segmentation	1
iv.	Shalu is working on a project that involves over a lakh of records. Which of the following should she use to make the best project? (a) Traditional programming (b) Manual processing (c) IoT (d) Neural networks	1

v.	Divyam was learning neural networks. He understood that there were three layers in a neural network. Help her identify the layer that does processing in the neural network. (a) Output layer (b) Hidden layer (c) Input layer (d) Data layer	1
vi.	State True / False Machine Learning is a subset of Deep Learning.	1
Q. 3	Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)	
i.	White Smoke is an example of _____ domain of AI (a) Data Science (b) Computer Vision (c) NLP (d) None of these	1
ii.	Assertion: Rule based AI model is a static model. Reasoning: Rule based model can evolve over changing data set. (a) Both A and R are true and R is the correct explanation for A (b) Both A and R are true and R is not the correct explanation for A (c) A is True but R is False (d) A is false but R is True	1
iii.	Which search engine(s) make use of data science algorithms? (a) Google only (b) Yahoo, Bing, Ask, AOL, and Google (c) Yahoo and Bing only (d) AOL, Ask, and Google only	1
iv.	A _____ system is a computer vision based technology that identifies or verifies or matches a digital image (live or stored) of a human face against a database of stored face images. (a) Face filter (b) Identification (c) Facial recognition (d) None of these	1
v.	How does AI contribute to the field of Data Science? (a) It makes data collection easier and faster. (b) It provides predictions and suggestions based on collected data. (c) It eliminates the need for human involvement in analyzing data. (d) It enhances technological knowledge for data collection.	1
vi.	_____ can be defined as the measure of balance between precision and recall. (a) Recall (b) Accuracy (c) Precision (d) F1 Score	1
Q. 4	Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)	
i.	Identify the data modelling technique.	1

	 (a) Regression (b) Classification (c) Clustering (d) Dimensionality reduction	
ii.	Kamal was learning the conditions that make up the confusion matrix. He came across a scenario in which the machine that was supposed to predict a furniture was always predicting not a furniture. What is this condition called? (a) False Positive (b) True Positive (c) False Negative (d) True Negative	1
iii.	Assertion (A): Image classification is the process of categorizing and labelling groups of pixels or vectors within an image based on specific rules. Reasoning (R): Image classification is a crucial step in medical imaging, allowing for the diagnosis of diseases from X-rays or MRI scans. (a) Both A and R are true, and R is the correct explanation for A. (b) Both A and R are true, but R is not the correct explanation for A. (c) A is true, but R is false. (d) A is false, but R is true.	1
iv.	_____ is the name of the popular programming language used in data science?	1
v.	Preeti has an Alexa device which is able to answer her questions based on the available data. This is an example of NLP, So which of the following is the type of data used by NLP applications? (a) Images (b) Numerical data (c) Graphical data (d) Text and Speech	1
vi.	The F1 score ranges from _____ to _____	1
Q. 5	Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)	
i.	What does a pixel represent in an image? (a) A segment of a video (b) The smallest unit of an image (c) The colour depth of an image (d) The brightness of an image	1
ii.	What do we call the process of dividing a string into component words? (a) Regression (b) Word Tokenization (c) Classification (d) Clustering	1

iii.	“Converting text to a common case” is a step in Text Normalization. (True/False)	1
iv.	When the prediction is False and reality is True, that condition is called _____ (a) TN (b) TF (c) FP (d) FN	1
v.	TFIDF stands for _____. (a) Team Frequency and Inverse Document Frequency (b) Term Frequency and Inverse Document Frequency (c) Top Frequency and Inverse Document Frequency (d) Table Frequency and Inverse Document Frequency	1
vi.	The percentage of true positive cases versus all the cases where the prediction is true is defined as (a) Precision (b) Accuracy (c) F1 Score (d) None of these	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	Feedback is the final component and one of the most important factors in the process of communication. Give two reasons to justify why feedback is important.	2
Q. 7	Ram is eager to know about the use of ICT, especially the role of ICT in education, so help him to know more about this term.	2
Q. 8	Swara is always punctual at school. She has a regular schedule that she follows every day. She plans for study and play time in advance. Enlist the four steps Swara must have followed for effective time management.	2
Q. 9	Kunal has a small convenience shop in his locality. There are many other convenience shops in the area. Yet, Kunal's shop survives the competition and does well. Which stage of an entrepreneur's career process can you relate this to? Explain.	2
Q. 10	“With increasing population and income, the consumption of goods is increasing day by day.” - Comment	2
	Answer any 4 out of the given 6 questions in 20 – 30 words each (2 x 4 = 8 marks)	
Q. 11	Write down some applications of AI in daily life.	2
Q. 12	Why we need to explore data through visualization?	2
Q. 13	Ankur is collecting data for his business through various resources on the internet. While accessing data from any of the data source, suggest any two points that needs to keep in mind while accessing data from any data source.	2
Q. 14	Describe an application of Computer Vision in the automotive industry.	2
Q. 15	Explain the difference between Stemming and Lemmatization.	2
Q. 16	Explain the concept of overfitting with respect to AI model evaluation.	2
	Answer any 3 out of the given 5 questions in 50– 80 words each (4 x 3 = 12 marks)	

Q. 17	Kavya went spending holidays to Nainital with her friend. She called a cab and the driver navigated the route using Google Maps on his smartphone. After they arrived, she was amazed to see that the Hotel door opened automatically as they approached it. They then went to a shop and bought some grocery and walked out without going through the cash counter and afterwards, she scanned a QR code and paid for the items purchased. Which technology was employed in everything she had experienced? Is the same technology used everywhere?	4																									
Q. 18	Name and explain with example the 4Ws of problem canvases under the problem scoping stage of the AI Project Cycle.	4																									
Q. 19	Do ethics in AI hamper data acquisition stage? Justify your answer with taking an example.	4																									
Q. 20	Alice, a student of class X was exploring the Natural Language Processing domain. She got stuck while performing the text normalization. Help her to normalize the text on the segmented sentences given below: Document 1: Sunderlal and Badri are best friends. Document 2: Sunderlal likes to play Guitar but Badri prefers to play keyboard.	4																									
Q. 21	Calculate Accuracy, Precision, Recall and F1 Score for the following Confusion Matrix on Water Shortage in Schools: Also suggest which metric would not be a good evaluation parameter here and why? <table><tr><td>The Confusion Matrix</td><td>Reality: 1</td><td>Reality: 0</td></tr><tr><td>Prediction: 1</td><td>75</td><td>5</td></tr><tr><td>Prediction: 0</td><td>5</td><td>15</td></tr></table> <table><tr><td>The Confusion Matrix</td><td>Reality: 1</td><td>Reality: 0</td><td></td></tr><tr><td>Prediction: 1</td><td>75</td><td>5</td><td>80</td></tr><tr><td>Prediction: 0</td><td>5</td><td>15</td><td>20</td></tr><tr><td></td><td>80</td><td>20</td><td>100</td></tr></table>	The Confusion Matrix	Reality: 1	Reality: 0	Prediction: 1	75	5	Prediction: 0	5	15	The Confusion Matrix	Reality: 1	Reality: 0		Prediction: 1	75	5	80	Prediction: 0	5	15	20		80	20	100	4
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