

BHARTIYA SHIKSHA BOARD(BSB)

MARKING SCHEME

ARTIFICIAL INTELLIGENCE (SUBJECT CODE - 171)

Sample Question Paper for Class XII (Session 2026-2027)

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.

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.	<p>Diya is giving instructions to her team during a project presentation. She uses short and meaningful sentences so everyone understands her clearly. Identify the type of communication used by Diya from the following options:-</p> <p style="text-align: center;">(A) Emotional (B) Accurate (C) Confusing (D) Negative</p> <p>दीया अपने प्रेजेंटेशन में छोटे और अर्थपूर्ण वाक्यों का उपयोग करती है ताकि सभी उसे स्पष्ट रूप से समझ सकें। यह किस प्रकार का संचार है?</p> <p>(A) भावनात्मक (Emotional) (B) सटीक (Accurate) (C) भ्रमित करने वाला (Confusing) (D) नकारात्मक (Negative)</p> <p>Answer: (D) Negative</p>	1
ii.	<p>Mohit remains calm and positive even after losing an inter-school competition. Which life skill is he showing ?</p> <p style="text-align: center;">(A) Stress management (B) Aggression (C) Carelessness (D) Dependency</p> <p>मोहित प्रतियोगिता हारने के बाद भी शांत और सकारात्मक रहता है। यह कौन-सा जीवन कौशल है?</p> <p>(A) तनाव प्रबंधन (Stress management) (B) आक्रामकता (Aggression) (C) लापरवाही (Carelessness) (D) निर्भरता (Dependency)</p> <p>Answer: (A) Stress management</p>	1
iii.	<p>A student studies hard because she enjoys learning new things, not because of marks or rewards. This is an example of :</p> <p style="text-align: center;">(A) External motivation (B) Intrinsic motivation (C) Financial motivation (D) Social motivation</p> <p>एक छात्रा पढ़ाई इसलिए करती है क्योंकि उसे सीखने में आनंद आता है, न कि अंकों या पुरस्कार के लिए। यह किस प्रकार की प्रेरणा है?</p> <p>(A) बाह्य प्रेरणा (External motivation) (B) आंतरिक प्रेरणा (Intrinsic motivation) (C) वित्तीय प्रेरणा (Financial motivation) (D) सामाजिक प्रेरणा (Social motivation)</p> <p>Answer: (B) Intrinsic motivation</p>	1

<p>iv.</p>	<p>What is the effect of applying a different layout to a slide in a presentation?</p> <p>a) The placement and organization of elements like text and pictures changes b) The font style and size of the text changes automatically c) A new slide is added to the presentation d) The slide background colour changes automatically</p> <p>स्लाइड में अलग लेआउट लगाने का क्या प्रभाव होता है?</p> <p>(A) टेक्स्ट और चित्रों की व्यवस्था बदल जाती है (B) फ्रॉन्ट अपने आप बदल जाता है (C) नई स्लाइड जुड़ जाती है (D) बैकग्राउंड कलर बदल जाता है</p> <p>Answer:</p> <p>a) The placement and organization of elements like text and pictures changes</p>	<p>1</p>
<p>v.</p>	<p>Assertion (A): Entrepreneurs help in generating employment opportunities. Reason (R): Entrepreneurs depend only on government funding to start businesses.</p> <p>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 incorrect d) A is incorrect but R is correct</p> <p>अभिकथन (A): उद्यमी रोजगार के अवसर पैदा करने में मदद करते हैं। कारण (R): उद्यमी व्यवसाय शुरू करने के लिए केवल सरकारी फंडिंग पर निर्भर रहते हैं।</p> <p>a) A और R दोनों सही हैं और R, A की सही व्याख्या है b) A और R दोनों सही हैं लेकिन R, A की सही व्याख्या नहीं है c) A सही है लेकिन R गलत है d) A गलत है लेकिन R सही है</p> <p>Answer:</p> <p>c) A is correct but R is incorrect</p>	<p>1</p>

vi.	<p>Which of the following is the best example of sustainable consumption?</p> <p>a) Using disposable plastic products for convenience b) Buying products with excessive packaging c) Choosing energy-efficient appliances to reduce electricity consumption d) Replacing electronic devices frequently with newer models</p> <p>निम्न में से सतत उपभोग (sustainable consumption) का सबसे अच्छा उदाहरण कौन-सा है? (A) प्लास्टिक उत्पादों का उपयोग (B) अत्यधिक पैकेजिंग वाले उत्पाद खरीदना (C) ऊर्जा-कुशल उपकरणों का चयन करना (D) बार-बार नए इलेक्ट्रॉनिक उपकरण खरीदना</p> <p>Answer:</p> <p>c) Choosing energy-efficient appliances to reduce electricity consumption</p>	1
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Q. 2	Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)	
i.	<p>Identify the stage of Data Science Methodology that focuses on collecting and preparing data for analysis?</p> <p>a) Business Understanding b) Data Collection c) Deployment d) Feedback</p> <p>डेटा साइंस मेथडोलॉजी का वह चरण कौन-सा है जो डेटा को एकत्रित (collect) करने और विश्लेषण (analysis) के लिए तैयार करने पर केंद्रित होता है?</p> <p>(A) बिज़नेस अंडरस्टैंडिंग (Business Understanding) (B) डेटा कलेक्शन (Data Collection) (C) डिप्लॉयमेंट (Deployment) (D) फीडबैक (Feedback)</p> <p>Answer:</p> <p>b) Data Collection</p>	1
ii.	<p>Which analytics suggest actions based on data insights ? (A) Descriptive (B) Diagnostic (C) Predictive (D) Prescriptive</p> <p>कौन-सा एनालिटिक्स डेटा इनसाइट्स के आधार पर कार्य (actions) सुझाता है? (A) वर्णनात्मक (Descriptive) (B) निदानात्मक (Diagnostic) (C) भविष्यवाणी संबंधी (Predictive) (D) निर्देशात्मक (Prescriptive)</p>	1

	<p>(B) मूल्यांकन (Evaluation)</p> <p>(C) समस्या निर्धारण / समस्या स्कोपिंग (Problem Scoping)</p> <p>(D) डेटा अधिग्रहण (Data Acquisition)</p> <p>Answer:</p> <p>(C) Problem Scoping</p>	
vi.	<p>A mobile phone camera captures photographs by storing millions of tiny colored squares. These tiny squares are called :</p> <p>(A) Kernels (B) Pixels</p> <p>(C) Layers (D) Vectors</p> <p>मोबाइल फोन कैमरा तस्वीरों को लाखों छोटे रंगीन वर्गों के रूप में संग्रहीत करता है। इन छोटे वर्गों को क्या कहा जाता है?</p> <p>(A) कर्नेल्स (Kernels) (B) पिक्सेल्स (Pixels)</p> <p>(C) लेयर्स (Layers) (D) वेक्टर्स (Vectors)</p> <p>Answer:</p> <p>(B) Pixels</p>	1

Q. 3	Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)	
i.	<p>Removing unwanted distortions from an image is called :</p> <p>(A) Cropping (B) Noise Reduction</p> <p>(C) Resizing (D) Segmentation</p> <p>चित्र (image) से अनचाहे विकृतियों (distortions) को हटाने की प्रक्रिया क्या कहलाती है?</p> <p>(A) क्रॉपिंग (Cropping) (B) नॉइज़ रिडक्शन (Noise Reduction)</p> <p>(C) रीसाइजिंग (Resizing) (D) सेगमेंटेशन (Segmentation)</p> <p>Answer:</p> <p>(B) Noise Reduction</p>	1
ii.	<p>Which neural network is commonly used in image recognition tasks ?</p> <p>(A) CNN (Convolutional Neural Network)</p>	1

	<p>Answer:</p> <p>(B) Object Detection</p>	
v.	<p>Which characteristic of Big Data refers to trustworthiness and accuracy ? (A) Volume (B) Velocity (C) Variety (D) Veracity</p> <p>Big Data की कौन-सी विशेषता डेटा की विश्वसनीयता और सटीकता (trustworthiness and accuracy) को दर्शाती है?</p> <p>(A) Volume (आयतन) (B) Velocity (गति) (C) Variety (विविधता) (D) Veracity (सत्यता/विश्वसनीयता)</p> <p>Answer:</p> <p>(D) Veracity</p>	1
vi.	<p>A social media company analyses videos, audio clips, memes, and photographs uploaded by users every day. This data is mainly :</p> <p>(A) Structured Data (B) Semi-structured Data (C) Unstructured Data (D) Numerical Data</p> <p>एक सोशल मीडिया कंपनी रोज़ उपयोगकर्ताओं द्वारा अपलोड किए गए वीडियो, ऑडियो क्लिप, मीम्स और फ़ोटो का विश्लेषण करती है। यह डेटा मुख्य रूप से किस प्रकार का है?</p> <p>(A) संरचित डेटा (Structured Data) (B) अर्ध-संरचित डेटा (Semi-structured Data) (C) असंरचित डेटा (Unstructured Data) (D) संख्यात्मक डेटा (Numerical Data)</p> <p>Answer:</p> <p>(C) Unstructured Data</p>	1

Q. 4	Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)	
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	<p>Answer:</p> <p>(B) Forward Propagation</p>									
<p>iv.</p>	<p>What does the term “deep” in Deep Learning refer to?</p> <p>(A) Size of the dataset used for training (B) Number of neurons in the output layer (C) Number of hidden layers in a neural network (D) Speed of model training</p> <p>डीप लर्निंग (Deep Learning) में “deep” शब्द किसे दर्शाता है?</p> <p>(A) प्रशिक्षण के लिए उपयोग किए गए डेटासेट का आकार (B) आउटपुट लेयर में न्यूरॉन्स की संख्या (C) न्यूरल नेटवर्क में हिडन लेयर्स की संख्या (D) मॉडल ट्रेनिंग की गति</p> <p>Answer:</p> <p>(C) Number of hidden layers in a neural network</p>	<p>1</p>								
<p>v.</p>	<p>Match the following:</p> <table border="1" data-bbox="242 1357 1323 1632"> <thead> <tr> <th>Column A</th> <th>Column B</th> </tr> </thead> <tbody> <tr> <td>1. CNN</td> <td>a. Sequential data</td> </tr> <tr> <td>2. RNN</td> <td>b. Image recognition</td> </tr> <tr> <td>3. Perceptron</td> <td>c. Binary classification</td> </tr> </tbody> </table> <p>a) 1→b, 2→a, 3→c b) 1→a, 2→b, 3→c c) 1→c, 2→a, 3→b d) 1→b, 2→c, 3→a</p> <p>Answer:</p> <p>a) 1→b, 2→a, 3→c</p>	Column A	Column B	1. CNN	a. Sequential data	2. RNN	b. Image recognition	3. Perceptron	c. Binary classification	<p>1</p>
Column A	Column B									
1. CNN	a. Sequential data									
2. RNN	b. Image recognition									
3. Perceptron	c. Binary classification									
<p>vi.</p>	<p>Which type of neural network is also known as Multi-Layer Perceptron (MLP) and processes data in a single forward direction from input to output?</p> <p>(A) Recurrent Neural Network (RNN) (B) Convolutional Neural Network (CNN)</p>	<p>1</p>								

	<p>Answer:</p> <p>(A) Transparency</p>	
<p>iii.</p>	<p>Which AI technique involves creating new videos by learning from existing videos, including animations and visual effects?</p> <p>(A) Image Classification (B) Video Generation using AI (C) Data Clustering (D) Text Summarization</p> <p>कौन-सी AI तकनीक मौजूदा वीडियो से सीखकर नए वीडियो बनाने का कार्य करती है, जिसमें एनिमेशन और विज़ुअल इफेक्ट्स शामिल होते हैं?</p> <p>(A) इमेज क्लासिफिकेशन (B) AI द्वारा वीडियो जनरेशन (Video Generation using AI) (C) डेटा क्लस्टरिंग (D) टेक्स्ट समरीकरण</p> <p>Answer:</p> <p>(B) Video Generation using AI</p>	<p>1</p>
<p>iv.</p>	<p>Assertion (A): Explaining data observations helps the audience understand how data behaves in different situations and why insights are generated.</p> <p>Reason (R): Visualizing data using charts and graphs helps stakeholders view data from different perspectives, enabling better analysis and decision-making.</p> <p>Choose the correct option:</p> <p>a) Both A and R are true and R is the correct explanation of A b) Both A and R are true but R is not the correct explanation of A c) A is true but R is false d) A is false but R is true</p> <p>अभिकथन (A): डेटा ऑब्ज़र्वेशन को समझाने से दर्शकों को यह समझने में मदद मिलती है कि डेटा विभिन्न परिस्थितियों में कैसे व्यवहार करता है और इनसाइट्स क्यों उत्पन्न होते हैं।</p> <p>कारण (R): चार्ट और ग्राफ़ के माध्यम से डेटा का विज़ुअलाइज़ेशन करने से हितधारक डेटा को अलग-अलग दृष्टिकोण से देख पाते हैं, जिससे बेहतर विश्लेषण और निर्णय लेने में मदद मिलती है।</p> <p>सही विकल्प चुनिए:</p> <p>a) A और R दोनों सही हैं और R, A की सही व्याख्या है b) A और R दोनों सही हैं लेकिन R, A की सही व्याख्या नहीं है c) A सही है लेकिन R गलत है d) A गलत है लेकिन R सही है</p>	<p>1</p>

Answer any 3 out of the given 5 questions on Employability Skills (2 x 3 = 6 marks)

Answer each question in 20 – 30 words.

<p>Q. 6</p>	<p>What is verbal communication? Give any two examples.</p> <p>मौखिक संचार (Verbal Communication) क्या है? इसके कोई दो उदाहरण दीजिए</p> <p>Answer:</p> <p>Verbal communication is the process of sharing information, ideas, or feelings using spoken or written words.</p> <p>Examples (any two):</p> <ol style="list-style-type: none">1. Face-to-face conversation between teacher and student2. Phone call or video call discussion	<p>2</p>
<p>Q. 7</p>	<p>Mention any two ways to improve self-confidence..</p> <p>आत्म-विश्वास (Self-confidence) को बढ़ाने के कोई दो तरीके बताइए।</p> <p>Answer:</p> <p>Any two ways to improve self-confidence are:</p> <ol style="list-style-type: none">1. Practicing positive thinking and self-affirmation2. Setting small achievable goals and accomplishing them3. Improving skills through regular practice and learning4. Maintaining good body language and communication skills	<p>2</p>
<p>Q. 8</p>	<p>a) What is cell referencing in spreadsheets? b) Name any two types of cell references.</p> <p>(a) स्प्रेडशीट में सेल रेफरेंसिंग (Cell Referencing) क्या है? (b) सेल रेफरेंस के कोई दो प्रकार लिखिए।</p> <p>Answer:</p> <p>a) Cell referencing in spreadsheets is a way of identifying and using the address of a cell (such as A1, B2) in a formula so that the data in that cell can be used for calculations or operations.</p> <p>b) Name any two types of cell references.</p> <ol style="list-style-type: none">1. Relative Cell Reference2. Absolute Cell Reference3. Mixed Cell Reference	<p>2</p>

<p>Q. 9</p>	<p>Identify the entrepreneurial qualities in the cases discussed below:</p> <p>a) Rohan started a small online business despite financial difficulties. b) Neha carefully studies customer feedback before launching new products.</p> <p>नीचे दिए गए परिदृश्यों (scenarios) में उद्यमी (Entrepreneurial) गुणों की पहचान कीजिए:</p> <p>(a) रोहन ने वित्तीय कठिनाइयों के बावजूद एक छोटा ऑनलाइन व्यवसाय शुरू किया। (b) नेहा नए उत्पाद लॉन्च करने से पहले ग्राहक प्रतिक्रिया (customer feedback) का ध्यानपूर्वक अध्ययन करती है।</p> <p>Answer:</p> <p>(a) Entrepreneurial quality: Risk-taking / Initiative</p> <ul style="list-style-type: none"> Rohan demonstrates risk-taking ability and initiative by starting a business despite financial challenges. <p>(b) Entrepreneurial quality: Analytical thinking / Market awareness / Decision-making</p> <ul style="list-style-type: none"> Neha shows analytical thinking and market awareness by carefully studying customer feedback before launching products. 	<p>2</p>
<p>Q. 10</p>	<p>What is e-waste? Mention any two methods for proper disposal of e-waste.</p> <p>ई-वेस्ट (E-waste) क्या है? ई-वेस्ट के उचित निपटान (disposal) के कोई दो तरीके बताइए।</p> <p>Answer:</p> <p>E-waste (Electronic waste) refers to discarded electronic devices such as old computers, mobile phones, televisions, and other electronic equipment that are no longer in use.</p> <p>Two methods for proper disposal of e-waste are:</p> <ol style="list-style-type: none"> Recycling – Extracting useful materials from electronic waste for reuse. Donating or reusing – Giving working electronic devices to others or charities. 	<p>2</p>

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

<p>Q. 11</p>	<p>Define Data Science Methodology. Why is it important?</p> <p>डेटा साइंस मेथडोलॉजी (Data Science Methodology) को परिभाषित कीजिए। यह क्यों महत्वपूर्ण है?</p>	<p>2</p>
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	<p>Answer:</p> <p>Data Science Methodology is a structured step-by-step process used to solve real-world problems using data. It includes stages such as problem scoping, data collection, data analysis, modeling, evaluation, and deployment.</p> <p>Importance: It is important because it provides a systematic approach to data analysis, ensures accurate and reliable results, improves decision-making, and helps in solving problems efficiently.</p>	
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<p>Q. 12</p>	<p>Explain any two applications of Computer Vision. कंप्यूटर विज्ञान (Computer Vision) के कोई दो अनुप्रयोग (applications) समझाइए।</p> <p>Answer:</p> <p>1. Facial Recognition: Computer vision is used in facial recognition systems to identify or verify a person based on their facial features. It is commonly used in smartphones and security systems.</p> <p>2. Self-driving Cars: Computer vision helps autonomous vehicles detect objects like pedestrians, traffic signals, and other vehicles to navigate safely on the road.</p>	<p>2</p>
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<p>Q. 13</p>	<p>Differentiate between Structured Data and Unstructured Data with examples संरचित डेटा (Structured Data) और असंरचित डेटा (Unstructured Data) में अंतर बताइए, उदाहरण सहित।</p> <p>Answer:</p> <table border="1" data-bbox="231 1624 1324 2072"> <thead> <tr> <th></th> <th data-bbox="518 1635 726 1668">Structured Data</th> <th data-bbox="981 1635 1220 1668">Unstructured Data</th> </tr> </thead> <tbody> <tr> <td data-bbox="247 1675 319 1709">Basis</td> <td></td> <td></td> </tr> <tr> <td data-bbox="247 1780 335 1854">Meaning</td> <td data-bbox="375 1780 782 1854">Data that is organized in a fixed format (rows and columns)</td> <td data-bbox="901 1780 1284 1854">Data that has no fixed format or structure</td> </tr> <tr> <td data-bbox="247 1888 335 1962">Storage</td> <td data-bbox="375 1888 726 1921">Stored in tables, databases</td> <td data-bbox="901 1888 1236 1962">Stored in files like images, videos, audio, text</td> </tr> <tr> <td data-bbox="247 1995 343 2069">Analysis</td> <td data-bbox="375 1995 734 2029">Easy to process and analyze</td> <td data-bbox="901 1995 1252 2029">Difficult to process directly</td> </tr> </tbody> </table>		Structured Data	Unstructured Data	Basis			Meaning	Data that is organized in a fixed format (rows and columns)	Data that has no fixed format or structure	Storage	Stored in tables, databases	Stored in files like images, videos, audio, text	Analysis	Easy to process and analyze	Difficult to process directly	<p>2</p>
	Structured Data	Unstructured Data															
Basis																	
Meaning	Data that is organized in a fixed format (rows and columns)	Data that has no fixed format or structure															
Storage	Stored in tables, databases	Stored in files like images, videos, audio, text															
Analysis	Easy to process and analyze	Difficult to process directly															

Examples:

- Structured Data: Student marks in a table, Excel sheets, database records
- Unstructured Data: Images, videos, emails, social media posts

Q. 14

2

A perceptron has the following inputs and weights with bias = -1:

Input Factor	Input	Weight
Attendance	1	4
Homework	1	3
Sports Activity	0	2

Calculate the predicted output.

एक परसेप्ट्रॉन (Perceptron) के निम्नलिखित इनपुट और वेट दिए गए हैं, जहाँ बायस = -1 है:

इनपुट फैक्टर	इनपुट	वेट
Attendance	1	4
Homework	1	3
Sports Activity	0	2

परसेप्ट्रॉन का पूर्वानुमानित (predicted) आउटपुट ज्ञात कीजिए।

Answer:

Given:

- Inputs: Attendance = 1, Homework = 1, Sports Activity = 0
- Weights: 4, 3, 2
- Bias = -1

Step 1: Calculate Weighted Sum

$$(1 \times 4) + (1 \times 3) + (0 \times 2) + (-1)(1 \times 4) + (1 \times 3) + (0 \times 2) + (-1)(1 \times 4) + (1 \times 3) + (0 \times 2) + (-1) = 4 + 3 + 0 - 1 = 4 + 3 + 0 - 1 = 4 + 3 + 0 - 1 = 6 = 6 = 6$$

Step 2: Apply Activation (Assume Step Function)

- If $\text{sum} \geq 0 \rightarrow \text{Output} = 1$
- If $\text{sum} < 0 \rightarrow \text{Output} = 0$

Since $6 \geq 0$,

✓ **Predicted Output = 1**

Q. 15

Differentiate between Generative AI and Traditional AI.

जनरेटिव AI (Generative AI) और पारंपरिक AI (Traditional AI) में अंतर बताइए।

Answer:

Basis	Traditional AI	Generative AI
Meaning	AI that analyzes data and makes decisions or predictions	AI that creates new content such as text, images, audio, or video
Output	Works on existing data to classify, predict, or analyze	Generates new and original content
Purpose	Decision-making and problem-solving	Content creation
Examples	Spam detection, recommendation systems, face recognition	ChatGPT, image generators, video generation tools

2

Q. 16

Mention any four important elements of effective Data Storytelling.

प्रभावी डेटा स्टोरीटेलिंग (Data Storytelling) के कोई चार महत्वपूर्ण तत्व लिखिए।

Answer:

Four important elements of effective Data Storytelling are:

1. **Data** – Accurate and relevant information used for analysis
2. **Narrative** – A clear and meaningful story that explains the data
3. **Visuals** – Charts, graphs, and images used to represent data

2

	4. Context – Background information that helps the audience understand the data better	
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Answer any 3 out of the given 5 questions in 50– 80 words each (4 x 3 = 12 marks)

Q. 17	<p>Differentiate between Holdout Validation and Cross-Validation (4 POINTS)</p> <p>होल्डआउट वैलिडेशन और क्रॉस-वैलिडेशन में अंतर बताइए तथा उपयुक्त चित्र बनाइए।</p> <p>Answer:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;"></th> <th style="width: 35%; text-align: center;">Holdout Validation</th> <th style="width: 35%; text-align: center;">Cross-Validation</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Basis</td> <td></td> <td></td> </tr> <tr> <td>Data Split</td> <td>Single split into training and testing set</td> <td>Data split into multiple folds</td> </tr> <tr> <td>Process</td> <td>Train once and test once</td> <td>Train and test multiple times</td> </tr> <tr> <td>Accuracy</td> <td>Less reliable</td> <td>More reliable</td> </tr> <tr> <td>Time</td> <td>Faster</td> <td>Slower</td> </tr> <tr> <td>Usage</td> <td>Simple datasets</td> <td>Better for small/medium datasets</td> </tr> </tbody> </table>		Holdout Validation	Cross-Validation	Basis			Data Split	Single split into training and testing set	Data split into multiple folds	Process	Train once and test once	Train and test multiple times	Accuracy	Less reliable	More reliable	Time	Faster	Slower	Usage	Simple datasets	Better for small/medium datasets	4
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Accuracy	Less reliable	More reliable																					
Time	Faster	Slower																					
Usage	Simple datasets	Better for small/medium datasets																					
Q. 18	<p>What is Big Data Explain? What are the three main sources of Big Data? Give two examples.</p> <p>बिग डेटा (Big Data) क्या है, समझाइए। बिग डेटा के तीन मुख्य स्रोत कौन-से हैं? दो उदाहरण दीजिए।</p> <p>Answer :</p> <p>Big Data refers to extremely large and complex datasets that regular computer programs and databases cannot handle. It comes from three main sources: transactional data (e.g., online purchases), machine data (e.g., sensor readings), and social data (e.g., social media posts). To analyze and use Big Data effectively, special tools and techniques are required. These tools help organizations find valuable insights hidden in the data, which lead to innovations and better decision-making. For example, companies like Amazon and Netflix use Big Data to recommend products or shows based on users' past activities.</p>	4																					
Q. 19	<p>Describe the structure and working of an Artificial Neural Network.</p> <p>कृत्रिम तंत्रिका नेटवर्क (Artificial Neural Network) की संरचना और कार्य को समझाइए।</p> <p>Answer:</p> <p>Structure of Artificial Neural Network (ANN):</p>	4																					

	<p>An Artificial Neural Network is a computing system inspired by the human brain. It consists of:</p> <ol style="list-style-type: none"> 1. Input Layer – Receives input data 2. Hidden Layer(s) – Processes data using weights and activation functions 3. Output Layer – Produces final result or prediction 4. Weights & Bias – Adjust importance of inputs 5. Activation Function – Helps decide final output <p>Working of ANN:</p> <ol style="list-style-type: none"> 1. Input data is fed into the input layer 2. Data moves forward through hidden layers 3. Each neuron applies weights and activation function 4. Output layer gives final prediction 5. Error is calculated and model is improved (training phase) 	
<p>Q. 20</p>	<p>i. What are transformers in LLMs? Give two leading examples of LLM. ii. Explain two applications of LLMs.</p> <p>i. LLMs में Transformers क्या होते हैं? LLM के दो प्रमुख उदाहरण दीजिए। ii. LLMs के दो अनुप्रयोग (Applications) समझाइए।</p> <p>Answer:</p> <p>Transformers are a type of neural network architecture that has revolutionized the field of Natural Language Processing (NLP), particularly in the context of Large Language Models (LLMs). The primary use of transformers in LLMs is to enable efficient and effective learning of complex language patterns and relationships within vast amounts of text data</p> <p>Two leading examples :</p> <ul style="list-style-type: none"> - OpenAI's GPT-4o: GPT-4 is multimodal and excels in processing and generating both text and images. - Google's Gemini 1.5 Pro: Integrates advanced multimodal capabilities for seamless text, image, and speech understanding. <p>Applications of LLMs:</p> <ul style="list-style-type: none"> ● Text Generation: LLMs are primarily employed for text generation tasks, including content creation, dialogue generation, story writing, and poetry generation. ● Audio Generation: While LLMs themselves do not directly generate audio signals, they can indirectly influence audio generation tasks through their text-to-speech (TTS) capabilities. 	<p>4</p>

Q21

4

What is Data Storytelling? Explain the role of narrative, visuals, and data in creating impactful stories.

डेटा स्टोरीटेलिंग (Data Storytelling) क्या है? प्रभावशाली कहानियाँ बनाने में नैरेटिव (Narrative), विज़ुअल्स (Visuals) और डेटा (Data) की भूमिका समझाइए।

Answer:

Data Storytelling is the process of presenting data in the form of a meaningful story using data, narrative, and visuals to make it easy to understand and useful for decision-making.

Role of Key Elements:

1. Data:

Data is the foundation of the story. Accurate and relevant data helps in deriving meaningful insights.

2. Narrative:

The narrative turns raw data into a clear and meaningful story that helps the audience understand the insights easily.

3. Visuals:

Visuals like charts, graphs, and images make complex data simple, attractive, and easier to interpret.
