CBSE | DEPARTMENT OF SKILL EDUCATION

ARTIFICIAL INTELLIGENCE (SUBJECT CODE - 843)

MARKING SCHEME 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. There is no negative marking.
   - iii. Do as per the instructions given.
   - iv. Marks allotted are mentioned against each question/part.
7. **SECTION B – SUBJECTIVE TYPE QUESTIONS (26 MARKS):**
   - i. This section contains 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. No.	QUESTION	Source Material (NCERT/PSSCIVE/ CBSE Study Material)	Unit / Chap. No.	Page no. of source material	Marks
Q. 1	**Answer any 4 out of the given 6 questions on Employability Skills (1 x 4 = 4 marks)**				
i.	c. Capitalization	NCERT	1	9	**1**
ii.	a. Paranoid personality disorder	NCERT	2	35	**1**
iii.	d. Intrinsic motivation	NCERT	2	24	**1**
iv.	c. Tableau	NCERT	3	40	**1**
v.	a. Perseverance	NCERT	4	97	**1**
vi.	d. Oxygen	NCERT	5	119	**1**
Q. 2	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	a. Root Mean Square Error	CBSE Study material	2	36	**1**
ii.	d. Detection/Segmentation	CBSE Study material	3	51	**1**

iii.	a. Both A and R are correct, and R is the correct explanation of A.	CBSE Study material	6	105	**1**
iv.	b. Generating new data that resembles existing data	CBSE Study material	7	124	**1**
v.	a. Freytag's Pyramid	CBSE Study material	8	154	**1**
vi.	a. Weight and Bias	CBSE Study material	6	107	**1**
Q. 3	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	c. Analytic Approach	CBSE Study material	2	20	**1**
ii.	d. MySQL	CBSE Study material	5	93	**1**
iii.	a. Standard Neural Network	CBSE Study material	6	110	**1**
iv.	a. Google's Lumiere	CBSE Study material	7	127	**1**
v.	b. 1 0 1 0 1 1 1 0 1 1	CBSE Study material	3	45	**1**
vi.	a. Log Loss	CBSE Study material	2	34	**1**
Q. 4	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	d. Extracting data from primary and secondary sources	CBSE Study material	2	23	**1**
ii.	b. High level processing	CBSE Study material	3	54	**1**
iii.	c. A□ 2 , B □ 1 , C □ 3	CBSE Study material	5	88	**1**
iv.	a. ReLU	CBSE Study material	6	105	**1**
v.	c. Heat map	CBSE Study material	8	156	**1**

vi.	c. Classification and Localization	CBSE Study material	3	51,52	**1**
Q. 5	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	True	CBSE Study material	2	26	**1**
ii.	a. Deep Neural Network	CBSE Study material	6	105	**1**
iii.	d. The resolution should be lower enough to get a detailed image which closely resembles the original one.	CBSE Study material	3	45	**1**
iv.	b. Plagiarism	CBSE Study material	7	133	**1**
v.	a. Veracity	CBSE Study material	5	91	**1**
vi.	b. Stories keep us fixed in the present and do not allow us to imagine other places or times.	CBSE Study material	8	148	**1**

SECTION B: SUBJECTIVE TYPE QUESTIONS

Q. No.	**QUESTION**	**Source Material (NCERT/PSSCIVE/ CBSE Study Material)**	**Unit / Chap. No.**	**Page no. of source material**	**Marks**
Answer any 3 out of the given 5 questions on Employability Skills in 20 – 30 words each (2 x 3 = 6 marks)					
Q. 6	The factors that act as barriers to active listening are • Being pre-occupied • Noise and visual distractions • Past experiences or mindset • Personal factors (**1/2 mark for each factor)**	NCERT	1	6	**2**
Q. 7	Big Five factors of FFM are : **Openness:** Individuals with openness to experience are, generally, creative, curious, active, flexible and adventurous. If a person is interested in learning new things, meeting new people and making friends, and likes visiting new places, the person can be called open-minded. **Consciousness:**	NCERT	2	33-34	**2**

	Individuals, who listen to their conscience, are self-disciplined, do their work on time, take care of others before themselves and care about others' feelings. **Extraversion:** Extroverts are individuals, who love interacting with people around and are, generally, talkative. A person, who can easily make friends and make any gathering lively, is confident and an extrovert. **Agreeableness:** Individuals having such a trait are, generally, kind, sympathetic, cooperative, warm and considerate. They accommodate themselves in any situation. For example, people who help and take care of others are, generally, agreeable. **Neuroticism** Neuroticism is a trait, wherein, individuals show tendency towards anxiety, self-doubt, depression, shyness and other similar negative feelings. People, who have difficulty in meeting others and worry too much about things, show signs of neuroticism. **(1 mark each for any two points)**				
Q. 8	Lakshmi can view the details of section XII B by using the feature 'Filters'. The steps to apply filter are: 1. Click on the AutoFilter icon on the Tool Bar. This will put filters at the top of each column. 2. Click on the filter for 'class' column. The drop-down will show a list of all the values in that column. 3. Keep Class XII-B alone checked and then click OK. Data of students only from Class XII-B will be displayed **(1/2 mark for mentioning Filters. 1/2 mark each for the above three points)**	NCERT	3	59	**2**
Q. 9	Organizational skills refer to the ability of making optimal use of one's time, energy and resources to achieve one's goals. **(1 mark)** The important organizational skills includes Time management, Goal setting, Efficiency and Managing quality. **(1 mark)**	NCERT	4	104-105	**2**
Q. 10	The main aim of National Action Plan on Climate Change (NAPCC) is to deal with climate change and related issues. The NAPCC comprises eight missions which address issues relating to mitigation of greenhouse gases and adaptation to the adverse impacts of climate change on environment, forests, habitat, water resources and agriculture.	NCERT	5	121	**2**

Answer any 4 out of the given 6 questions in 20 – 30 words each (2 x 4 = 8 marks)					
Q. 11	Some of the common techniques used in preprocessing stage are: **Noise Reduction**: It removes unwanted elements like blurriness, random spots, or distortions. This makes the image clearer and reduces distractions for algorithms. Example: Removing grainy effects in low-light photos. **Image Normalization:** Standardizes pixel values across images for consistency. Adjusts the pixel values of an image so they fall within a consistent range (e.g., 0–1 or -1 to 1). Ensures all images in a dataset have a similar scale, helping the model learn better. Example: Scaling down pixel values from 0–255 to 0–1. **Resizing/Cropping**: Changes the size or aspect ratio of the image to make it uniform. Ensures all images have the same dimensions for analysis. Example: Resizing all images to 224×224 pixels before feeding them into a neural network. **Histogram Equalization**: Adjusts the brightness and contrast of an image. Spreads out the pixel intensity values evenly, enhancing details in dark or bright areas. Example: Making a low-contrast image look sharper and more detailed. **(Any two points – 1 mark each)**	CBSE Study material	3	49-50	**2**
Q. 12	Evaluation in an AI project cycle is the process of assessing how well a model performs after training. **(1 mark)** The two main phases of Evaluation is First phase – Diagnostic measures and Second phase – Statistical significance test **(1/2 mark for each phase)**	CBSE Study material	2	29	**2**

Q. 13	Propagation functions define how signals propagate through the network during both forward and backward passes. Forward pass is known as Forward Propagation and backward pass is known as Back Propagation. • **Forward Propagation** In the forward propagation, input data flows through the layers, and activations are computed. Here, input data flows through the network layers, and activations are computed. The predicted output is compared to the actual target (ground truth), resulting in an error (loss). **(1 mark for any two point)** • **Back Propagation** Backpropagation, (short for "backward propagation of errors") is an optimization algorithm used during neural network training. It adjusts the weights of the network based on the error (loss) obtained in the previous iteration (epoch). In Back propagation, gradients are propagated to update weights using optimization algorithms (e.g., gradient descent). **(1 mark for any two point)**	CBSE Study material	6	106	**2**

Q. 14	V's of 3V framework are Volume, Velocity and Variety **Volume:** YourMedia processes huge amounts of data from millions of users, including watch history, ratings, searches, and preferences to offer personalized content recommendations. **Velocity:** Data is processed in real-time, allowing YourMedia to immediately adjust recommendations, track the patterns of the users, and offer trending content based on their activity. **Variety:** The platform handles diverse data such as user profiles, watch lists, video content, and user reviews which are categorized as structured, semi-structured, and unstructured data. **(Mentioning two names – 1 mark)** **(Explanation – 1 mark)**	CBSE Study material	5	91	**2**
Q. 15	This data when it is pictorially represented is known as Data Visualization. It can be in the form of different types of charts or graphs. **(1 mark)** Data visualization is a powerful way to show context. Data charts can reveal crucial deviations or affinities in the data that can lead to insights. **(1 mark)**	CBSE Study material	8	150, 155	**2**
Q. 16	The emergence of deepfake AI technology raises concerns about the authenticity of digital content. Deepfake algorithms can generate compelling fake images, audio, and videos, jeopardising trust in media integrity and exacerbating the spread of misinformation. For example deepfake videos have been used to superimpose individuals' faces onto adult content without their consent, leading to privacy violations and reputational damage.	CBSE Study material	7	132	**2**
Answer any 3 out of the given 5 questions in 50– 80 words each (4 x 3 = 12 marks)					

Q. 17	Big data analytics involves collecting, processing, cleaning, and analyzing enormous datasets to improve organizational operations. The working process of big data analytics includes the following steps – **Step 1. Gather data** Each company has a unique approach to data collection. Organizations can collect structured and unstructured data from various sources, including cloud storage, mobile apps and IoT sensors. **Step 2. Process Data** Once data is collected and stored, it must be processed properly to get accurate results on analytical queries, especially when it's large and unstructured. Various processing options like Batch processing and Stream processing are available. **Step 3. Clean Data** Scrubbing all data, regardless of size, improves quality and yields better results. Correct formatting and elimination of duplicate or irrelevant data are essential. Erroneous and missing data can lead to inaccurate insights. **Step 4. Analyze Data** Getting big data into a usable state takes time. Once it is ready, advanced analytics processes can turn big data into big insights. **(1 mark for each step)**	CBSE Study material	5	93	**4**
Q. 18	**a.** The full form of LLM is Large Language Model. It is a deep learning algorithm that can perform a variety of Natural Language Processing (NLP) tasks, such as generating and classifying text, answering questions in a conversational manner, and translating text from one language to another. **(2 marks)** **b.** OpenAI's GPT-4o, Google's Gemini 1.5 Pro, Meta's LLaMA 3.1, Anthropic's Claude 3.5, Mistral AI's Mixtral	CBSE Study material	7	128-130	**4**

	8x7B are examples of Large Language Models **(1 mark for mentioning any two models)** **c.** Limitations of LLM are Processing text requires significant computational resources, leading to high response time and costs. LLMs prioritise natural language over the accuracy, which may result in generating factually incorrect or misleading information with high confidence. LLMs might memorize specific details rather than generalize, leading to poor adaptability. **(1 mark for any two limitations)**				
Q. 19	Data storytelling is the art and practice of translating complex data and analytics into a compelling narrative that is easily understandable and relatable to various audiences. (**1mark)** The three key elements of Data Storytelling are: 1. Data 2. Narrative 3. Visuals **Data:** Basic facts or raw facts about any entity is known as Data. Data is the primary building block of every data story. It serves as the foundation for the narrative and visual elements of the story. **(Any two points -1mark)** **Narrative**: It refers to the structure or storyline that is crafted to present insights derived from data in a clear, engaging, and informative manner to the audience. It involves identifying and organizing the key information in a linear and coherent fashion, ensuring that the storyline is crisp, and contextual. A well-defined narrative allows audience to understand the significance of insights and how they relate to the broader context of the data analysis. **(Any two points -1mark)** **Visuals:** Visuals refer to the pictorial representations of data using various graphs, charts, and diagrams. They serve as a scene of the data presented in a graphical format, helping to convey complex information more clearly and effectively. They enable the audience to visualize trends, patterns, and anomalies in the data, facilitating better understanding and interpretation of the insights being communicated. **(Any two points -1mark)**	CBSE Study material	8	150-153	**4**

Q. 20	Descriptive Modeling is a concept in data science and statistics that focuses on summarizing and understanding the characteristics of a dataset without making predictions or decisions. This includes summarizing the main characteristics, patterns, and trends that are present in the data. **(1 mark)** Common Descriptive Techniques are: 1. Summary Statistics like mean, median, mode, standard deviation, variance, range, percentile etc. 2. Visualizations like Graphs and charts to represent the data such as Bar charts, Histograms, Pie charts etc. **(1/2 mark each for any one technique from summary statistics and visualization)** Predictive modeling involves using data and statistical algorithms to identify patterns and trends in order to predict future outcomes or values. It relies on historical data and uses it to create a model that can predict future behavior or trends or forecast what might happen next. **(1 mark)** It involves techniques like regression, classification, and time-series forecasting **(1/2 mark each for any one technique)**	CBSE Study material	2	27-28	**4**
Q. 21	A neural network is a machine learning program, or model, that makes decisions in a manner similar to the human brain, by using processes that mimic the way biological neurons work together to identify phenomena, weigh options and arrive at conclusions. Every neural network comprises layers of interconnected nodes — an input layer, hidden layer(s), and an output layer. **Input Layer:** This layer consists of units representing the input fields. Each unit corresponds to a specific feature or attribute of the problem being solved. **Hidden Layers:** These layers, which may include one or more, are located between the input and output layers. Each hidden layer contains nodes or artificial neurons, which process the input data. These nodes are interconnected, and each connection has an associated weight. **Output Layer:** This layer consists of one or more units representing the target field(s). The output units generate the final predictions or outputs of the neural network. **(1 mark for definition of neural network and 1 mark for explaining each layer)**	CBSE Study material	6	104	**4**