Detailed Marking Breakdown for Task 1: Image Classification ML Assignment

Detailed Summary of Marks Distribution

Section	Subsection Detail	Marks
Approach (30 marks)	Class Imbalance Identification	2
	Exploratory Data Analysis (EDA)	2
	Justification of Data Handling Methods	2
	Performance Metrics Selection	2
	Data Splitting Strategy	2
	Prevention of Data Leakage	2
	Base Model Selection and Justification	3
	Handling Class Imbalance	2
	Algorithm Configuration	1
	Identification of Overfitting/Underfitting	2
	Optimization Techniques	2
	Validation Set Use	2
	Final Model Accuracy	3
	Robustness and Generalizability	3
Independent Evaluation (10 marks)	**2.1 Comparative Analysis** Comparison with Baseline and Literature (3) Fairness and Consistency (2)	5
	2.2 Critical Discussion Insightful Discussion (3) Real-world Applicability (2)	5
Report Presentation (10 marks)	Logical Flow	2
	Readability	2
	Consistent Formatting	1
	Quality of Visualizations	3
	Integration with Text	2
Total Marks	**Total**	**50**

1. Approach (60%, 30 marks)

1.1 Data Exploration and Understanding (6 marks)

- **Class Imbalance Identification (2 marks)**: Explicitly identifies class imbalance and discusses its implications clearly.
- **Exploratory Data Analysis (EDA) (2 marks)**: Provides clear visualizations and insightful observations about the dataset.
- **Justification of Data Handling Methods (2 marks)**: Clearly explains and justifies preprocessing decisions (e.g., normalization, augmentation).

1.2 Evaluation Framework (6 marks)

- **Performance Metrics Selection (2 marks)**: Chooses and justifies metrics suitable for class imbalance (e.g., macro F1-score, precision, recall).
- **Data Splitting Strategy (2 marks)**: Clearly defines and justifies train-validation-test splits or cross-validation approach.
- **Prevention of Data Leakage (2 marks)**: Demonstrates understanding and correct implementation of splitting methods by patient or subject to avoid leakage.

1.3 Model Selection and Justification (6 marks)

- **Base Model Selection and Justification (3 marks)**: Clearly identifies and thoroughly justifies the choice of base models (CNN, ANN, etc.) over alternatives.
- **Handling Class Imbalance (2 marks)**: Implements and justifies techniques like data augmentation, weighting, or resampling.
- **Algorithm Configuration (1 mark)**: Clearly explains hyperparameters and model configuration choices.

1.4 Model Optimization (6 marks)

- **Identification of Overfitting/Underfitting (2 marks)**: Provides clear visual evidence (learning curves) and accurate discussion.
- **Optimization Techniques (2 marks)**: Clearly applies and explains methods used to address fitting issues (dropout, regularization, etc.).
- **Validation Set Use (2 marks)**: Correct and justified usage of validation set for hyperparameter tuning.

1.5 Model Performance and Robustness (6 marks)

- **Final Model Accuracy (3 marks)**: Clearly demonstrates achieving good performance aligned with established goals or benchmarks.
- **Robustness and Generalizability (3 marks)**: Demonstrates and discusses model robustness across different subsets or scenarios.

2. Independent Evaluation (20%, 10 marks)

2.1 Comparative Analysis (5 marks)

- **Comparison with Baseline and Literature Models (3 marks)**: Clearly presents comparisons and justifications using suitable performance metrics.
- **Fairness and Consistency (2 marks)**: Ensures fair and accurate comparison against independently sourced literature and models.

2.2 Critical Discussion (5 marks)

- **Insightful Discussion (3 marks)**: Provides a critical analysis of strengths, weaknesses, and insights relative to literature.
- **Real-world Applicability (2 marks)**: Clearly identifies and discusses the applicability and limitations of the developed models.

3. Report Presentation (20%, 10 marks)

3.1 Clarity and Structure (5 marks)

- **Logical Flow (2 marks)**: Report narrative is logically structured and coherent.
- **Readability (2 marks)**: Clearly written with concise and grammatically correct language.
- **Consistent Formatting (1 mark)**: Maintains consistency and clarity throughout the report.

3.2 Visualizations and Justifications (5 marks)

- **Quality of Visualizations (3 marks)**: Figures and tables clearly illustrate and justify the results and decisions.
- **Integration with Text (2 marks)**: Visual aids are directly referred to and integrated effectively into textual analysis.