Task: "Build & Judge a Mini AI"

Part 1 — Chronology of AI
(Write one real-world example for each stage:
Machine Learning →
Deep Learning →
Computer Vision →
NLP →
LLMs →)

ANS:-

Machine Learning → Spam filters in emails that learn from examples with labels.
Deep Learning → Autonomous vehicles that employ neural networks to identify lanes and obstacles.
Computer Vision → Facial recognition in mobile phones (e.g., Face ID).
NLP → Chatbots able to understand customer questions and respond.
LLMs → ChatGPT producing human-like responses on any topic.

Part 2 — Deep Learning Architectures
(Match the model to the use case:
1. RNN
2. LSTM
3. CNN
4. Transformer
Use cases:
Image recognition
Text translation (old Google Translate)
Predicting the next word in ChatGPT
Early speech-to-text systems)

ANS:-

RNN → Early speech-to-text systems
LSTM → Text translation (old Google Translate)
CNN → Image recognition
Transformer → Predicting the next word in ChatGPT

Part 3 — Frameworks
(Choose one framework (PyTorch / TensorFlow / Keras).
In one sentence, explain why you would use it if you were a student making a cat-vs-dog classifier.)

ANS:-

Chosen: PyTorch
"I'd use PyTorch because it's beginner-friendly, has dynamic computation graphs, and great community support for building a cat-vs-dog classifier."

(Imagine you built a spam filter. Answer:
Precision: If it marks 10 emails as spam and 7 are truly spam → what's
Precision?
Recall: If there were 12 spam emails in total, how many did it catch?
(use same example)
F1 Score: Use the formula and calculate (round to 2 decimals).
MSE/MAE: Predict your friend's age (actual = 15, prediction = 18). Which
metric punishes the error more?
BLEU/ROUGE: AI translated "The cat sat on the mat" as "Cat is on the
mat." Which metric (BLEU/ROUGE) do you think would give a high score?)

ANS:-

Precision: $7/10 = 0.70$
Recall: $7/12 \approx 0.58$
F1 Score:
$F1 = (2 \times \text{Precision} \times \text{Recall})/(\text{Precision} + \text{Recall}) = 2 \times 0.70 \times 0.58/0.70 + 0.58 = 0.63$

MSE vs MAE (actual = 15, predicted = 18):

MAE = 3
MSE = 9 → MSE penalizes the error more.

BLEU vs ROUGE:
BLEU would rate high because the translation is similar words and structure.

(You built an AI that predicts loan approvals.
A customer asks, "Why was my loan rejected?"Write one simple way to explain the decision fairly
(e.g., "Your income was too
low compared to the loan size").)

ANS:-

"Your loan was rejected because your income was too low compared to the loan amount requested,
which wasn't meeting our approval requirements.