SECTION A (12 marks)

1. Fill in the blanks. 1 mark for every two blanks. **[3 marks]**
   a) Machine learning is defined as:
   A computer program is said to learn from **(i)** _____ with respect to some class of **(ii)** _____ and **(iii)** _____, if its performance at **(iv)** _____, as measured by **(v)** _____, improves with **(vi)** _____.

2. One of the main types of machine learning is reinforcement learning.
   a) List the other **two** main types of machine learning. **[2 marks]**

   _____

   _____

   b) State the main difference between the two types of machine learning listed in (a)? **[2 marks]**

   _____

   _____

   _____

   _____

3. List the **two** main types of classifications. **[2 marks]**

   _____

   _____

4. What is the set of data points that are considerably different than the remainder of the data called? **[1 mark]**

   _____

5. What is the difference between voice recognition and speech synthesis? **[2 marks]**

   _____

   _____

Scanned with CamScanner

SECTION B (13 marks)

1. There are two types of classification error: Type I error (False Positive) and Type II error (False Negative). Suppose a flood occurs but no alarm is triggered. What type of error is this? Explain your answer. **[3 marks]**

_____

_____

2. A Random Forest model is trained with 400 trees on a computer that has 8 CPU cores.
   a) What happens when n_jobs = None? **[1 mark]**

   _____

   b) What happens when n_jobs = - 1? **[1 mark]**

   _____

   c) Approximately how many sequential rounds of training are required? **[1 mark]**

   _____

   d) What is the advantage of using multiple CPU cores? **[1 mark]**

   _____

3. A model is used to classify emails as spam or not spam. Out of 100 emails, 30 are actually spam and 70 are not spam. The model correctly predicts 25 spam emails and 50 not spam emails.
   a) Fill in the confusion matrix below. **[4 marks]**

	Predicted: Spam	Predicted: Not Spam
Actual: Spam	TP = _____	FN = _____
Actual: Not Spam	FP = _____	TN = _____

   b) Using the results above, calculate the **Precision** and **Recall** of the model. **[2 marks]** Use the formulas below.

$$Precision = \frac{TP}{TP+FP} \qquad Recall = \frac{TP}{TP+FN}$$

- END OF PAPER -

Scanned with CamScanner