

2025

M.Sc. 3rd Semester Examination

COMPUTER SCIENCE

Paper : COS - 305

(Deep Learning)

Full Marks : 25

Time : One Hour

*The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.*

Group - A

Answer any *two* questions : $2 \times 2 = 4$

1. What are the limitations of image classification task using Multilayer Perceptron?
2. Distinguish between clustering and classification.
3. Mention the role of activation function in deep learning models.
4. What are generative models in deep learning? Name two popular types. $1+1$

Group - B

Answer any *two* questions : $4 \times 2 = 8$

5. Discuss how pooling layers work in CNNs. Distinguish between max and average pooling. $2+2$

P.T.O.

(2)

6. What are overfitting and underfitting problems? How can you handle such problems? 2+2
7. Highlight the applications of deep generative models in image and text generation. 4
8. A binary classifier produced the following confusion matrix :

	Predicted Positive	Predicted Negative
Actual Positive	80	20
Actual Negative	10	90

Obtain the accuracy, precision for the positive class, recall for the positive class, and the F1 score for the positive class. 1+1+1+1

Group - C

Answer any *one* question : 8×1=8

9. (a) What is CBAM? Explain it with a diagram.
- (b) Find out the feature map of X after ReLU operation where $X = \begin{bmatrix} -1 & 4 \\ 5 & 1 \end{bmatrix}$. (1+4)+3
10. (a) Explain the architecture and working of a Convolutional Neural Network (CNN).
- (b) For input feature map size = 128×128, kernel = 5×5, stride = 2, and padding = 1, calculate the output spatial size (height × width) after 2D convolution operation. 5+3

Internal Assessment : 5 marks
