

**PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)**

**BSc DEGREE EXAMINATION MAY 2026
(Sixth Semester)**

Common to Branches – **MATHEMATICS & MATHEMATICS WITH COMPUTER APPLICATIONS**

MAJOR ELECTIVE COURSE – II – ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Which of the following is a component of Artificial Intelligence? (i) Learning (ii) Training (iii) Tuning (iv) Creating	K1	CO1
	2	Agents behavior can be best described by _____ (i) Sensors (ii) Agent function (iii) Actuators (iv) Perception sequence	K2	CO1
2	3	A toy shop wants to predict the number of Barbie dolls which would be sold the next three months. Find what type of problem. (i) Unsupervised (ii) Supervised (iii) Reinforcement (iv) Hybrid	K1	CO2
	4	The cost function is also known as _____ (i) Squared error function (ii) Mean squared error (iii) Least square estimator (iv) Both (i) and (ii)	K2	CO2
3	5	Which of the following is a data preprocessing method? (i) Data cleaning (ii) Data visualization (iii) Data loss (iv) Data duplication	K1	CO3
	6	Show where Eigen values and Eigen vectors takes place in dimensionality reduction (i) Linear Discriminant Analysis (ii) Principal Component Analysis (iii) Independent Component Analysis (iv) Dependent Component Analysis	K2	CO3
4	7	Select the plot is best suited to test linear relationship of y(dependent) x(independent) continuous variable. (i) Bar chart (ii) Histogram (iii) Scatter plot (iv) Pie chart	K1	CO4
	8	Relate standard error of estimate is a measure of the _____ of predictions. (i) Variance (ii) Speed (iii) Covariance (iv) Accuracy	K2	CO4
5	9	Which of the following are real world applications of SVM? (i) Image classification (ii) Text Categorization (iii) Clustering of news articles (iv) All of the above	K1	CO5
	10	Show which of the following algorithm is most sensitive to outliers? (i) k-means (ii) k-medians (iii) k-modes (iv) k-medoids	K2	CO5

Cont...

SECTION - B (35 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Outline the applications of AI techniques.	K2	CO1
		(OR)		
	11.b.	Summarize briefly about a problem space and state space.		
2	12.a.	Explain the uses of machine learning with an example.	K2	CO2
		(OR)		
	12.b.	Compare how minimizing the cost function used for single-variable function and two-variable function.		
3	13.a.	Identify the data cleaning steps and implement for the real-time dataset.	K2	CO3
		(OR)		
	13.b.	Make use of data integration and data transformation and explain its uses in data preprocessing.		
4	14.a.	Distinguish between supervised learning and regression.	K3	CO4
		(OR)		
	14.b.	Examine a Karl Pearson's coefficient of correlation evaluation metrics.		
5	15.a.	Relationship between Margin and Optimal Hyperplane. Explain with a graph.	K3	CO5
		(OR)		
	15.b.	Inspect the requirements of clustering.		

SECTION -C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks

(3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Illustrate the architecture of agent environment.	K2	CO1
2	17	Analyze the role of gradient function in minimizing a cost function.	K3	CO2
3	18	Apply Principal Component Analysis for any real-time dataset.	K2	CO3
4	19	Build the steps to establish a linear regression.	K3	CO4
5	20	Explain briefly about a k-Means algorithm with suitable example.	K3	CO5

Z-Z-Z

END