PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc(SS) DEGREE EXAMINATION MAY 2023
(Eighth Semester)

Branch – **SOFTWARE SYSTEMS**
(Five years Integrated)

DISCIPLINE SPECIFIC ELECTIVE – III: MACHINE LEARNING

Time: Three Hours | Maximum: 75 Marks

SECTION-A (10 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 x 1 = 10)

1 _____is a method of data analysis that automates analytical model building.
(i) Artificial Intelligence (ii) Machine Learning
(iii) Data Sciences (iv) Deep Learning

2 Choose a disadvantage of decision trees among the following.
(i) Decision trees are robust to outliers (ii) Factor analysis
(iii) Decision trees are prone to overfit (iv) All of the above

3 The procedure to incrementally update each of weights in neural is referred to as
(i) synchronisation (ii) learning law
(iii) learning algorithm (iv) both learning algorithm & law

4 Neural Networks are complex _____with many parameters.
(i) Linear Functions (ii) Nonlinear Functions
(iii) Discrete Functions (iv) Exponential Functions

5 A statement made about a population for testing purpose is called
(i) Statistic (ii) Hypothesis
(iii) Level of Significance (iv) Test-Statistic

6 Match the following:

	List – A		List – B
a)	Type I Error	i)	Small standard error
b)	Large sample	ii)	Non-parametric
c)	Multiple regression	iii)	False positive
d)	Chi-square test	iv)	One dependent variable

(i) (a) – (iv), (b) – (i), (c)-(ii), (d)-(iii)
(ii) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)
(iii) (a)-(ii), (b)-(iii), (c)-(i), (d)-(iv)
(iv) (a)-(iii),(b)-(iv), (c)-(i), (d)-(ii)

7 **Statement -I** : A genetic algorithm is a stochastic hill-climbing search in which a large population of states is maintained.
Statement -II: In nondeterministic environments, agents can apply AND-OR search to generate contingent plans that reach the goal regardless of which outcomes occur during execution.
In the light of the above statements, choose the correct answer from the options given below.
(i) Both statements are true
(ii) Both statements are false
(iii) Stat. I is true, but Stat. II is false
(iv) Stat. II is true, but Stat. I is false

8 Consider the following:
(a) Evolution (b) Selection (c) Reproduction (d) Mutation
Which of the following are found in genetic algorithms?
(i) (b), (c) and (d) only (ii) (b) and (d) only
(iii) (a), (b), (c) and (d) (iv) (a), (b) and (d) only

9 How many types of feedback does reinforcement provide?
(i) 1 (ii) 2
(iii) 3 (iv) 4

Cont...

10 Which kind of data does reinforcement learning use?
(i) Labeled data (ii) Unlabelled data
(iii) None (iv) Both

SECTION - B (25 Marks)

Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 x 5 = 25)

11 a Explain about the problems of decision tree learning.
OR
b Justify to avoid overfitting the data in decision tree learning.

12 a Discuss the perceptron training rule in detail.
OR
b Illustrate threshold unit algorithm with example.

13 a Analyze the Basics of Sampling Theory.
OR
b What is Mean and Variance in Binomial Distribution? Evaluate them with an example.

14 a Organize Genetic operator and illustrate the types of crossover operators.
OR
b State about population Evolution and the Schema Theorem.

15 a Solve an algorithm for learning Q for a function with an example.
OR
b Determine about temporal difference learning.

SECTION -C (40 Marks)

Answer **ALL** questions
ALL questions carry **EQUAL** Marks
Question No.16 is Compulsory (5 x 8 = 40)

16 Define Missing Attribute values. Elucidate how to handle the training examples with missing values and differing cost in detail.

17 a Detail discussion about the Back propagation Algorithm with example.
OR
b Justify the convergence and local minima with an example.

18 a Differentiate in error of two hypotheses with example.
OR
b Compare two learning algorithms with a specific hypothesis.

19 a Illustrate an example to view as a general optimization method that searches a large space of candidate objects seeking best performance according to the fitness function.
OR
b Discuss the Evolution and Learning in detail.

20 a Analyze the learning task with a problem.
OR
b Predict to handle nondeterministic MDPS to extend the Q learning algorithm for the deterministic case.

Z-Z-Z END