

No. of Printed Pages : 8

A9.5-R5.1 - ARTIFICIAL INTELLIGENCE CONCEPTS AND R PROGRAMMING

DURATION : 03 Hours

MAXIMUM MARKS : 100

OMR Sheet No. :					
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Roll No. :

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Answer Sheet No. :

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Name of Candidate : _____ ; Signature of Candidate : _____

INSTRUCTIONS FOR CANDIDATES :

- Carefully read the instructions given on Question Paper, OMR Sheet and Answer Sheet.
- Question Paper is in English language. Candidate has to answer in English language only.
- There are **TWO PARTS** in this Module/Paper. **PART ONE** contains **FOUR** questions and **PART TWO** contains **FIVE** questions.
- **PART ONE** is Objective type and carries **40** Marks. **PART TWO** is Subjective type and carries **60** Marks.
- **PART ONE** is to be answered in the **OMR ANSWER SHEET** only, supplied with the question paper, as per the instructions contained therein. **PART ONE** is **NOT** to be answered in the answer book for **PART TWO**.
- Maximum time allotted for **PART ONE** is **ONE HOUR**. Answer book for **PART TWO** will be supplied at the table when the Answer Sheet for **PART ONE** is returned. However, Candidates who complete **PART ONE** earlier than one hour, can collect the answer book for **PART TWO** immediately after handing over the Answer Sheet for **PART ONE** to the Invigilator.
- **Candidate cannot leave the examination hall/room without signing on the attendance sheet and handing over his/her Answer Sheet to the invigilator. Failing in doing so, will amount to disqualification of Candidate in this Module/Paper.**
- After receiving the instruction to open the booklet and before answering the questions, the candidate should ensure that the Question Booklet is complete in all respects.

DO NOT OPEN THE QUESTION BOOKLET UNTIL YOU ARE TOLD TO DO SO.

PART ONE

(Answer **all** the questions. Each question carries **ONE** mark)

1. Each question below gives a multiple choice of answers. Choose the most appropriate one and enter in the "OMR" answer sheet attached to the question paper, following instructions therein. (1x10)

1.1 Which of the following is NOT true in AI ?

- (A) Implements heuristic search operation
- (B) Solution steps are not explicit
- (C) Knowledge is imprecise
- (D) It works on or implements repetition mechanism

1.2 Which of the following are the traditional problems of AI ?

- (A) Planning
- (B) Reasoning
- (C) Perception
- (D) All the above

1.3 State space in AI is defined as :

- (A) The whole problem
- (B) Problem you design
- (C) Representing your problem with variable and parameter
- (D) Both (A) and (B)

1.4 Procedural Domain Knowledge in a rule-based system, is in the form of :

- (A) Meta rules
- (B) Control rules
- (C) Production rules
- (D) None

1.5 Amongst of the following Examples, which one would you address using a supervised learning Algorithm ?

- (A) given a set of news articles found on the web, group them into set of articles about the same story
- (B) given email labelled as spam or not spam, learn a spam filter
- (C) given a database of customer data, automatically discover market segments and group customers into different market segments
- (D) find the patterns in market basket analysis

1.6 Some company wants to segment their customers into distinct groups, this is an example of :

- (A) supervised learning
- (B) unsupervised learning
- (C) data extraction
- (D) reinforcement learning

- 1.7 Which type of data is generated during the bank transaction ?
- (A) Unstructured data
 - (B) Structured data
 - (C) Semi-structured data
 - (D) None
- 1.8 What would be the probability of an event 'G' if H denotes its complement, according to the axioms of probability ?
- (A) $P(G) = 1 - P(H)$
 - (B) $P(G) = P(H)$
 - (C) $P(G) = 1 + P(H)$
 - (D) $P(G) = 1 / P(H)$
- 1.9 From the following _____ function is used to import a csv file in R.
- (A) read.csv()
 - (B) read.excel()
 - (C) read.file
 - (D) None of above
- 1.10 In R programming what is used to define as a graphical representation of data using colors to visualize the value of matrix ?
- (A) Barplot
 - (B) Scatterplot
 - (C) Heatmap
 - (D) None of above
2. Each statement below is either TRUE or FALSE. Choose the most appropriate one and ENTER in the "OMR" sheet ATTACHED TO the question paper, following instructions therein. (1x10)
- 2.1 Smart washing machine is an example of a Machine Learning devices.
- 2.2 A machine is artificially intelligent when it can accomplish tasks by itself.
- 2.3 Not all formal languages are context-free.
- 2.4 A neural network is an artificial intelligence system that is capable of finding and differentiating patterns.
- 2.5 The independent variable is discrete in regression analysis.
- 2.6 Linear and nonlinear are types of correlation.
- 2.7 Root means square error is an evaluation measure for classification.
- 2.8 Emails are considered structured data.
- 2.9 In R, we can access the column by putting a comma (,) before c().
- 2.10 In R, we can change the start angle of the pie chart with the arg.angle parameter.

3. Match words and phrases in column X with the closest related meaning / word(s) / phrase(s) in column Y. Enter your selection in the "OMR" answer sheet attached to the question paper, following instructions therein.

(1x10)

X		Y	
3.1	Image Classification	A	The amount of time cars wait at a red light.
3.2	Exponential distribution	B	used to define the performance of a classification algorithm
3.3	Decision Tree	C	Application of Computer Vision
3.4	The distance measure is similar to Simple Matching Coefficient	D	paste()
3.5	To create a sequence of numbers.	E	Hamming distance
3.6	Confusion Matrix	F	Machine learning algorithm
3.7	Continuous uniform distribution	G	used to define the performance of a clustering algorithm
3.8	Histogram	H	seq()
3.9	JSON data	I	Unstructured data
3.10	Function to concatenate strings	J	Used graph to show frequency distributions
		K	Time between earthquakes.
		L	Deep learning algorithm
		M	Semi- structured data

4. Each statement below has a blank space to fit one of the word(s) or phrase(s) in the list below. Enter your choice in the "OMR" answer sheet attached to the question paper, following instructions therein.

(1x10)

A	Random forest	B	Same	C	Linear regression
D	Matrix()	E	DIM	F	Discrete random variable
G	NLP	H	Biometric Identification	I	Multiple regression
J	Clustering	K	Learning element	L	Prolog
M	Two				

- 4.1 _____ is an application of AI.
- 4.2 In a class, a teacher has grouped students according to their level of intelligence like Below Average, Average, Above Average and Brilliant to evaluate their academic performance. This is an example of _____.
- 4.3 _____ is the suitable language for AI.
- 4.4 _____ algorithms are used to detect fake news so that the audience has a high level of trust in the news channel.
- 4.5 _____ machine learning algorithm is based upon the idea of bagging.
- 4.6 _____ supervised learning algorithm can predict only numeric value.
- 4.7 If a variable of certain integer values between two given points is called _____.
- 4.8 The slopes of two regression lines parallel to each other would be _____.
- 4.9 In R, a matrix can be created with the _____ function.
- 4.10 To create an array in R-programming, the _____ parameter specifies the dimensions.

PART TWO

(Answer any FOUR Questions)

5. (a) Differentiate between OLAP and OLTP.
 (b) Explain the following with reference to the R-programming
 (i) Lists (ii) Matrices
 (c) What is regression? Find linear regression straight line equation for the following data:

X	4	6	8	10
Y	7	5	3	2

(5+5+5)

6. (a) What is mean, median and mode ? Write a code to implement in python.
 (b) What are the components of Artificial Intelligence? Explain any two in detail.
 (c) Define agents in AI. List down the types of agents and explain any one with the example.

(3+6+6)

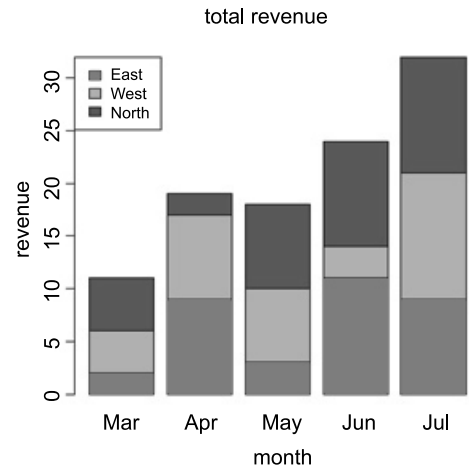
7. (a) Explain structured, unstructured and semi-structured data type.
 (b) What is factors in R ? How to create factors ? What is the use of them ? Explain with example.
 (c) What's the Difference Between AI & Traditional Analytics ?

(5+6+4)

8. (a) Explain the use of AI in Fraud Detection and Management in Finance Industry.
 (b) How AI Can ensure better Cyber Security ?
 (c) What is K-means algorithm ? How it works ? Explain with example.

(3+4+8)

9. (a) What is the basic syntax for creating a bar-chart in R ? Describe the input parameters to the barplot() function. Write the code to plot the following bar chart.



- (b) Differentiate the classification and regression algorithm.
 (c) Which are the types of vectors in R ? How to create vectors ? Explain syntax with example.

(6+5+4)

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SPACE FOR ROUGH WORK

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