

CENTRAL UNIVERSITY OF HARYANA

End Semester Examinations May 2022

Programme: MCA

Session: 2021-22

Semester: IV

Max. Time: 3 Hours

Course Title: Data Science with R Programming

Max. Marks: 70

Course Code: SBS CS 01 04 26 C 4004

Instructions:

1. Question no. 1 has seven parts and students need to answer any four. Each part carries three and a half Marks.
2. Question no. 2 to 5 have three parts and students need to answer any two parts of each question. Each part carries seven marks.

Q 1. (4X3.5=14)

- a) What is Big Data? List any five sources of big data production?
- b) Discuss the various applications of Data Science.
- c) Define mean, mode, median and standard deviation with the help of formulas.
- d) What is list? Explain it to create and access elements of it with suitable example.
- e) What is Box plot? Explain the importance of boxplot with example?
- f) Define multiple regression and logistic regression.
- g) What is correlation Analysis? Also draw diagram for positive and negative correlation.

Q 2. (2X7=14)

- a) Explain the various components of Hadoop Eco System in detail.
- b) Describe Exploratory data analysis in detail with the help of suitable examples.
- c) What is Data Serialisation and Data Integration? Discuss and differentiate structured and unstructured data with the help of suitable examples.

Q3. (2X7=14)

- a) Explain data frame and lists in R programming by using suitable examples.
- b) What are the various data types available in R programming? Explain in detail.
- c) Consider the following matrix:

	col1	col2	col3
row1	5	6	7
row2	8	9	10
row3	11	12	13
row4	14	15	16

- (i) Write a R script to create the above matrix.
- (ii) Replace element equal to 12 with the value 0.
- (iii) Replace all elements having value greater than 12 by the value 4.
- (iv) Find transpose of the given matrix.
- (v) Add row in the matrix with the values (17,18,19).
- (vi) Add column in the matrix with the values (24,28,49).

Q 4.

(2X7=14)

- (a) Discuss the different operations that can be performed on matrices in R.
- (b) Consider three vectors: p, q, r. Write a R script to plot line graph with multiple lines in a single graph using the data of given vectors. Differentiate the lines with different colors.

vector1: (17, 25, 38, 13, 41)

vector2: (22, 19, 36, 19, 23)

vector3: (25, 14, 16, 34, 29)

- (c) Consider the following data:

emp_id	emp_name	salary	start_date
1	Rick	623	2012-01-01
2	Dan	515	2013-09-23
3	Michelle	611	2014-11-15
4	Ryan	729	2014-05-11
5	Gary	843	2015-03-27

- (i) What is a Data Frame?
- (ii) Write a R script to create a data frame with the above data.
- (iii) Get the structure of the data frame.
- (iv) Get the summary of the data frame.
- (v) Extract first two rows from the data frame.
- (vi) Extract data of 3rd and 4th row with 2nd and 4th column.

Q 5.

(2X7=14)

- a) Explain measures of central tendency and dispersion with suitable examples.
- b) Compute the correlation coefficient for the following data.

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	58	70

- c) Write short note on: (any one)
 - (i) Logistic regression
 - (ii) Chi-square test
 - (iii) F test for equality of variances

CENTRAL UNIVERSITY OF HARYANA

End Semester Examinations June 2022

Programme: MCA

Semester: 4th

Course Title: Wireless Sensor Network and Internet of Things

Course Code: SBS CS 01 04 27 C 4004

Session: 2021- 2022

Max. Time: 3 Hours

Max. Marks: 70

Instructions:

1. Question no. 1 has seven parts and students need to answer any four. Each part carries three and half Marks.
2. Question no. 2 to 5 have three parts and student need to answer any two parts of each question. Each part carries seven marks.

Q 1.

(4X3.5=14)

- a) What is Wireless Sensor? write any two applications of it.
- b) What is Medium Access Control in Wireless Networks?
- c) Discuss the various Hardware Components of WSNs.
- d) Describe the concept of interdependencies in WSNs.
- e) Define “Things” in Internet of Things(IOT) with suitable example.
- f) What is PTC Thingworx?
- g) What is Connected Vehicles?

Q 2.

(2X7=14)

- a) What is Routing ? Explain the role of routing in the WSNs.
- b) Discuss various topology management in Wireless Sensor network.
- c) Discuss the following:
 - a. Medium Access Control in Wireless Networks.
 - b. Enabling Technologies for WSNs

Q3.

(2X7=14)

- a) Explain the architecture of wireless sensor network in detail.
- b) Discuss the design principles for wireless sensor network in detail with proper diagram.
- c) Discuss the following:
 - a. Execution Environments
 - b. Sensor Nodes

Q 4.

(2X7=14)

- a) Explain the various layers of IOT (Internet of Things) system.
- b) What is IoT(Internet of Things) ecosystem? Explain with the help of diagram.
- c) Discuss the concept of machine to machine Communications in detail.

Q 5.

(2X7=14)

- a) Explain the working concept of smart grid with the help of functional diagram.
- b) Discuss various kind of IOT frameworks with the help of suitable example.
- c) What is Arduino board? Explain the concept of Integration of sensors and actuators with Arduino.