

MAHATMA GANDHI UNIVERSITY
BCA (HONOURS) FIFTH SEMESTER PRACTICAL EXAMINATION
Practical Model question Paper (2024 ADMISSION ONWARDS)
MG5DSEBCA300 -**Introduction to Data Science**

Instructions to Examiners

Duration of the Examination: 1.5 Hrs

Maximum Marks: 35

- Students must submit their Lab Record to attend the Semester End Examination.
- Conduct an individual Viva-Voce for the course.

Evaluation Criteria:

Logic - 10 Marks

Successful Compilation - 5 Marks

Output - 5 Marks

Viva - 10 Marks

Record - 5 Marks

MAHATMA GANDHI UNIVERSITY
BCA (HONOURS) FIFTH SEMESTER PRACTICAL EXAMINATION
(2024 ADMISSION ONWARDS)
MG5DSEBCA300 - **Introduction to Data Science**

Duration of the Examination: 1.5 Hrs

Maximum Marks: 35

An automotive research organization wants to predict the fuel efficiency of vehicles in Miles Per Gallon (mpg) based on vehicle design specifications.

The dataset `car_efficiency` contains 100 observations with the following variables:

`mpg`: Miles per gallon — Dependent Variable

`hp`: Engine horsepower — Independent Variable

`wt`: Vehicle weight (in 1,000 lbs) — Independent Variable

`accel`: Acceleration time from 0 to 60 mph (in seconds) — Independent Variable

1. Create or load the dataset in R as a data frame named `car_efficiency`. Print its structure (`str`) and basic statistical summary (`summary`).
2. Fit a Multiple Linear Regression model predicting `mpg` using `hp`, `wt`, and `accel`. Save the model as `fit_car` and display the statistical summary output using `summary(fit_car)`.
3. Extract the regression coefficients using `coef(fit_car)`. Write out the full linear regression equation and explain the physical meaning of the coefficient for `wt` (weight).
4. Predict the estimated fuel efficiency (`mpg`) for a car with 150 hp, weighing 3,200 lbs (`wt = 3.2`), and taking 14.5 seconds to accelerate to 60 mph (`accel = 14.5`). Round the predicted value to 2 decimal places.

[A][CO5]

MAHATMA GANDHI UNIVERSITY
BCA (HONOURS) FIFTH SEMESTER PRACTICAL EXAMINATION
(2024 ADMISSION ONWARDS)
MG5DSEBCA301 -**Time Series Analysis**

Instructions to Examiners

Duration of the Examination: 1.5 Hrs

Maximum Marks: 35

- Students must submit their Lab Record to attend the Semester End Examination.
- Conduct an individual Viva-Voce for the course.

Evaluation Criteria:

- Logic - 10 Marks
- Successful Compilation - 5 Marks
- Output - 5 Marks
- Viva - 10 Marks
- Record - 5 Marks

MAHATMA GANDHI UNIVERSITY
BCA (HONOURS) FIFTH SEMESTER PRACTICAL EXAMINATION
(2024 ADMISSION ONWARDS)
MG5DSEBCA301 -Time Series Analysis

Duration of the Examination: 1.5 Hrs

Maximum Marks: 35

Creating Various Types of Charts in Tableau Question:

Using the dataset **Sales_Charts_Data.xlsx**, construct the following six standard visualization charts in Tableau: Bar Chart, Continuous Line Chart (Time Series), Pie Chart (with Percent of Total calculation), Scatter Plot, Treemap, and Dual-Axis Chart.

Input Dataset: Sales_Charts_Data.xlsx

Order_ID	Order_Date	Region	Sales	Profit
ORD-01	2025-01-15	South	12000	2500
ORD-02	2025-02-10	North	45000	8100
ORD-03	2025-03-05	East	18000	3200
ORD-04	2025-04-18	West	54000	9800
ORD-05	2025-05-22	South	28000	4600
ORD-06	2025-06-12	North	32000	-1500
ORD-07	2025-07-20	East	61000	11000
ORD-08	2025-08-14	West	42000	7400

Expected Output:

- **Bar Chart:** Sorted regional sales comparisons colored by profit.
- **Line Chart:** Continuous monthly time-series sales progression.
- **Pie Chart:** Regional sales contribution displayed with percentage share labels.
- **Scatter Plot:** Sales versus Profit correlation plot with disaggregated Order ID points.
- **Treemap:** Hierarchical nested rectangles sized by Sales and colored by Profit.
- **Dual-Axis Chart:** Combined Bar (Sales) and Line (Profit) chart sharing a synchronized timeline.

[A][CO5]

MAHATMA GANDHI UNIVERSITY
BCA (HONOURS) FIFTH SEMESTER PRACTICAL EXAMINATION
(2024 ADMISSION ONWARDS)
MG5DSEBCA302 -**Machine Learning**

Instructions to Examiners

Duration of the Examination: 1.5 Hrs

Maximum Marks: 35

- Students must submit their Lab Record to attend the Semester End Examination.
- Conduct an individual Viva-Voce for the course.

Evaluation Criteria:

Logic - 10 Marks

Successful Compilation – 5 Marks

Output - 5 Marks

Viva – 10 Marks

Record – 5 Marks

MAHATMA GANDHI UNIVERSITY
BCA (HONOURS) FIFTH SEMESTER PRACTICAL EXAMINATION
(2024 ADMISSION ONWARDS)
MG5DSEBCA302 -Machine Learning

Duration of the Examination: 1.5 Hrs

Maximum Marks: 35

An e-commerce analytic team wants to segment 100 retail stores across India based on three key performance metrics:

Annual Revenue (revenue, in Lakhs of Rupees, ₹)

Customer Satisfaction Score (satisfaction, scale 1–100)

Marketing Spend (marketing_spend, in Thousands of Rupees, ₹)

Perform Agglomerative Hierarchical Clustering in R to group similar stores and visualize the hierarchy using a dendrogram.

[A][CO5]

FIFTH SEMESTER PRACTICAL EXAMINATION (2024 ADMISSION ONWARDS)
MG5DSEBCA303-Neural Networks

Instructions to Examiners

Duration of the Examination: 1.5 Hrs

Maximum Marks: 35

- Students must submit the Lab Record to attend the Semester End Examination.
- Ask students to write the Source code for the assigned problem.
- Conduct a Viva-Voce (oral examination) for the course.

Evaluation Criteria:

Coding - 10 Marks

Output - 10 Marks

Viva - 10 Marks

Record - 5 Marks

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)

FIFTH SEMESTER PRACTICAL EXAMINATION (2024 ADMISSION ONWARDS)
MG5DSEBCA303-Neural Networks

Duration: 1.5 hr

Maximum Marks: 35

1. Write a Python program using TensorFlow or PyTorch to design and train a neural network for solving the XOR classification problem.

[A] [CO5]

MAHATMA GANDHI UNIVERSITY
BCA (HONOURS) FIFTH SEMESTER PRACTICAL EXAMINATION
(2024 ADMISSION ONWARDS)
MG5DSEBCA304 -**Digital Image Processing**

Instructions to Examiners

Duration of the Examination: 1.5 Hrs

Maximum Marks: 35

- Students must submit their Lab Record to attend the Semester End Examination.
- Conduct an individual Viva-Voce for the course.

Evaluation Criteria:

Problem Understanding, Design and Coding 10 Marks

Output 10 Marks

Viva - 10 Marks

Record - 5 Marks

MAHATMA GANDHI UNIVERSITY
BCA (HONOURS) FIFTH SEMESTER PRACTICAL EXAMINATION
(2024 ADMISSION ONWARDS)
MG5DSEBCA304 -**Digital Image Processing**

Duration of the Examination: 1.5 Hrs

Maximum Marks: 35

Write and execute a program in Python to perform histogram stretching on a given grayscale image. The program should enhance the image contrast by stretching the intensity values to the range 0–255.

Display the following:

1. Original grayscale image.
2. Histogram of the original image.
3. Histogram-stretched image.
4. Histogram of the enhanced image.

Compare and comment on the contrast enhancement obtained.

[A][CO5]

MAHATMA GANDHI UNIVERSITY
BCA (HONOURS) FIFTH SEMESTER PRACTICAL EXAMINATION
(2024 ADMISSION ONWARDS)
MG5DSEBCA305-Natural Language Processing

Instructions to Examiners

Duration of the Examination: 1.5 Hrs

Maximum Marks: 35

- Students must submit their Lab Record to attend the Semester End Examination.
- Conduct an individual Viva-Voce for the course.

Evaluation Criteria:

Problem Understanding, and Coding - 10 Marks

Output - 10 Marks

Viva - 10 Marks

Record - 5 Marks

MAHATMA GANDHI UNIVERSITY
BCA (HONOURS) FIFTH SEMESTER PRACTICAL EXAMINATION
(2024 ADMISSION ONWARDS)
MG5DSEBCA305-Natural Language Processing

Duration of the Examination: 1.5 Hrs

Maximum Marks: 35

Q1. Write and execute a program in Python to perform part-of-Speech tagging using NLTK. Display the following:

1. Tokenization
2. POS tags
3. Penn Treebank tags
4. Noun, verb and adjective identification.

[A][CO5]

FIFTH SEMESTER PRACTICAL EXAMINATION (2024 ADMISSION ONWARDS)

MG5DSEBCA306 Web Development with Python - Django/Flask

Instructions to Examiners

Duration of the Examination: 1.5 Hrs

Maximum Marks: 35

- Students must submit the Lab Record to attend the Semester End Examination.
- Ask students to write the procedure/ Source code for the assigned problem.
- Conduct a Viva-Voce (oral examination) for the course.

Evaluation Criteria:

Logic - 10 Marks

Implementation - 10 Marks

Output - 5 Marks

Viva - 5 Marks

Record - 5 Marks

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)

FIFTH SEMESTER PRACTICAL EXAMINATION (2024 ADMISSION ONWARDS)

MG5DSEBCA306 Web Development with Python - Django/Flask

Duration: 1.5 hr

Maximum Marks: 35

1. Develop a Flask application using SQLAlchemy to perform Add, View, Update, and Delete operations on employee records.

[A] [CO5]

FIFTH SEMESTER PRACTICAL EXAMINATION (2024 ADMISSION ONWARDS)

MG5DSEBCA307 Cross-Platform Application Development with Dart and Flutter

Instructions to Examiners

Duration of the Examination: 1.5 Hrs

Maximum Marks: 35

- Students must submit the Lab Record to attend the Semester End Examination.
- Ask students to write the procedure/ Source code for the assigned problem.
- Conduct a Viva-Voce (oral examination) for the course.

Evaluation Criteria:

Logic	- 10 Marks
Successful Compilation	- 5 Marks
Output	- 5 Marks
Viva	- 10 Marks
Record	- 5 Marks

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)

FIFTH SEMESTER PRACTICAL EXAMINATION (2024 ADMISSION ONWARDS)

MG5DSEBCA307 Cross-Platform Application Development with Dart and Flutter

Duration: 1.5 hr

Maximum Marks: 35

1. Develop a flutter application to compute index mark of a science student using the formula

$$\text{index mark} = (\text{physics marks} + \text{chemistry marks} + 2 * \text{mathematic marks}) / 400.$$

[A] [CO5]