

PUSASQF405
APPLICATIONS OF IT - BASICS OF PYTHON

Time: 2 hours

Total Marks: 60

Note:

1. The candidate has the option to either question 3A or question 3B. Rest all questions are mandatory.
2. Numbers to the right indicate full marks.
3. The candidates will be provided with the formula sheet and graphs (if required) for the examination.
4. Use of approved scientific calculator is allowed.

Q1. Attempt All questions.

A. Write a python program and function to generate prime numbers up to 1000. **5 Marks**

B. Write a program in python to calculate the interest earned by a customer. from the bank after depositing a principal amount for 5 years. Take input. from the customer for principal amount and the interest provided by the the bank was at 5.25%.
(Formula: $\text{principal_amount} \times \text{intrest_rate} \times \text{years}$) **5 Marks**

C. Create a dataframe 2 dataframes, one for students and another for academic details. Store them in df1 and df2. Split the data based on condition. Result and merge the data based on name and on students whose result was P in data post-split. **5 Marks**

student_details:

```
data = {
    "Name": ["Alice", "Bob", "Charlie", "David"],
    "Age": [30, 40, 25, 50],
    "Gender": ["F", "M", "M", "M"],
    "City": ["New York", "Los Angeles", "Chicago", "Houston"]
}
```

academic_details:

```
data = {
    "Name": ["Alice", "Charlie", "David", "Bob", "Alice", "David"],
    "Marks": [75, 80, 55, 78, 40, 67],
    "TransactionType": ["P", "P", "P", "P", "F", "P"]
}
```

Q2. Attempt All questions.

- A.** Write a python function to accept 3 sides a,b and c of a triangle and check if the triangle is equilateral or not. **5 Marks**

Condition to check if triangle is equilateral: All sides will be equal.

- B.** Write a program to print list containing the running subtraction and then take square of the below list.

```
input_list = [1,2,3,4,5,6,7,8,9]
```

Hint: Running subtraction with square = `output_list.append((output_list[i-1] - input_list[i])**2)` **5 Marks**

- C.** A company Z is well known for manufacturing balcony blinds. Create a python function such that the price of the balcony blind is Rs. 500 per square feet and do the following:

- i. Ask user to input the area of the blind. **(2.5)**
- ii. Create a function such that the input is passed to calculate the final bill amount which includes 25% of manufacturing cost of the total bill amount, 6% CGST and 6% SGST of the total bill amount. Provide the final bill charges. **(2.5)**

```
manufacturing_amount = 0.1 * bill_amount
```

```
cgst = 0.09 * bill_amount
```

```
sgst = 0.09 * bill_amount
```

```
total_bill = bill_amount + manufacturing_amt + cgst + sgst
```

Q3. Attempt question 3A or question 3B.

A. Load the auto-mpg.csv dataset in python. Perform Linear Regression on the dataset

30 Marks

- a. Read the dataset. (2)
- b. Drop the car name column. (5)
- c. Convert horsepower column into numeric. (5)
- d. Drop any row which has missing values. (5)
- e. Split the dataset into train and test with test size 20% (5)
- f. Perform Linear Regression (5)
- g. Provide the value for RMSE. (3)

OR

B. Load the built-in iris dataset. Build a model to predict the species of the plant based on their corresponding features. Predict using Logistic Regression.

30 Marks

- a. Read the dataset. (5)
- b. Split X.data in X and Y.target in Y (5)
- c. Perform train test split with test size 20% (5)
- d. Run the logistic regression model. (5)
- e. Predict the values for test dataset. (5)
- f. Find the accuracy of the model. (5)