

Plot No. 2, Knowledge Park-III, Greater Noida (U.P.) –201306  
**POST GRADUATE DIPLOMA IN MANAGEMENT (2023-25)**  
**END TERM EXAMINATION (TERM -III)**

Subject Name: **Business Analytics**

Time: **01.30 hrs.**

Sub. Code: **PGIT32**

Max Marks: **40**

**Note: 1. Use MS-Excel on separate Laptops.**

**2. Use of MS Excel 2019 version /SPSS 26.0 is suggested.**

**3. After attempting all the sub parts of the question, COPY in your own Pen Drive (PD) and hand over the PD to the invigilator for SUBMISSION. MAKE SURE YOU SUBMIT THE RIGHT FILE**

**4. COPY of content/Use of others PD would be considered as UFM.**

**5. Use of Mobile phones/Smart watch/Calculators/Wi-Fi hotspot/Browser/WhatsApp or similar apps/Earphones is NOT allowed in any way.**

**CO1-** Apply effective business analytics within an organization for decision-making L3

**CO2-** Analyze complex problems using advanced analytics tools/Excel/Power BI L4

**CO3-** Analyze predictive and forecasting techniques for business predictions L4

**CO4-** Propose decisions using descriptive, predictive business analytics results L5

**All questions are compulsory and carry equal marks**

**[8 Marks \* 5=40 Marks]**

**Q1. (A).** Identify and write the Data type in the following data

Gender	Age	Education	Income	Spendin g	Ad Frequenc y	Stereotyp e
Female	23	Some undergraduat e courses	\$10,000 to < \$20,000	500	10	9

**Q1. (B).** Refer to the data given below in Table and answer the following

a. What is the average miles per gallon(MPG) for city driving?

b. On average, how much higher is the miles per gallon for highway driving as compared to city driving?

c. What percentage of the cars have four-cylinder engines?

d. What percentage of the cars use regular fuel?

**Q1. (C).** The following table reports the percentage of stocks in a portfolio for nine quarters from 2018 to 2020.

Use exponential smoothing with a smoothing constant of  $\alpha = 0.5$  to find out which smoothing constant provide the accurate forecast.

Interpret the findings.

**Q2. Case:** Metropolitan Research, a consumer research organization, conducts surveys designed to evaluate a wide variety of products and services available to consumers. In one particular study, Metropolitan looked at consumer satisfaction with the performance of automobiles produced by a major Detroit manufacturer. A questionnaire sent to owners of one of the manufacturer's full-sized cars revealed several complaints about early transmission

problems. To learn more about the transmission failures, Metropolitan used a sample of actual transmission repairs provided by a transmission repair firm in the Detroit area. The following data show the actual number of miles driven for 50 vehicles at the time of transmission failure.

**Q. 2 (A).** Use appropriate descriptive statistics to summarize the transmission failure data

**Q. 2 (B).** Develop a 95% confidence interval for the mean number of miles driven until transmission failure for the population of automobiles with transmission failure. Provide a managerial interpretation of the estimate

**Q. 2 (C).** What other information would you like to gather to evaluate the transmission failure problem more fully.

### Interpret the results.

**Q. 3. Case:** The Consumer Reports Restaurant Customer Satisfaction Survey is based upon 148,599 visits to full-service restaurant chains. Assume the following data are representative of the results reported. The variable Type indicates whether the restaurant is an Italian restaurant or a seafood/steakhouse. Price indicates the average amount paid per person for dinner and drinks, minus the tip. Score reflects diners' overall satisfaction, with higher values indicating greater overall satisfaction. A score of 80 can be interpreted as very satisfied.

**Q. 3. (A).** Write null and alternate hypotheses.

**Q. 3. (B).** Develop the estimated regression equation to show how overall customer satisfaction is related to the independent variable average meal price.

**Q. 3. (C).** At the .05 level of significance, test whether the estimated regression equation developed in part (a) indicates a significant relationship between overall customer satisfaction and average meal price.

### Interpret the results.

**Q. 4. Case:** The Binni Bike Company has been in business for five years. During that time, sales of bikes increased from 12 units in the first year to 76 units in the most recent year. Jacob, the firm's owner, wants to develop a forecast of bike sales for the coming year. The historical data for 5 years is given below.

**Q. 4. (A).** Construct a time series plot. What type of pattern exists in the data?

**Q. 4. (B).** Develop the linear trend equation for the time series. What is the average increase in sales that the firm has been realizing per year? Forecast sales for years 6 and 7.

**Q. 5. Case:** The Zenith Hotel is owned and operated by Sara. The restaurant just completed its third year of operation. Since opening her restaurant, Sara has sought to establish a reputation for the Zenith as a high-quality dining establishment that specializes in fresh seafood. Through the efforts of Sara and her staff, her restaurant has become one of the best and fastest growing restaurants on the island.

To better plan for future growth of the restaurant, Sara needs to develop a system that will enable her to forecast food and beverage sales by month for up to one year in advance. Table below shows the value of food and beverage sales (\$1000s) for the first three years of operation.

**Q. 5. (A).** A time series plot. Comment on the underlying pattern in the time series. Do analysis of the seasonality of the data, if it exists.

**Q. 5. (B).** Using the smoothing constant approach, forecast sales for January through December of the fourth and Fifth year.

**Kindly fill the total marks allocated to each CO's in the table below:**

Q. No.	COs	Marks Allocated	Bloom' Level
Question 1a,1b	CO1	4 Marks	L6
Question 2a,2b, 3	CO2	12 Marks	L6
Question 4a,5	CO3	12 Marks	L6
Question 1c, 2c,4b	CO4	12 Marks	L6s