



JP – 715

III Semester M.B.A. (Day/Evening) Examination, May/June 2023  
(Freshers) (CBCS Scheme) (2022 – 23 and Onwards)  
MANAGEMENT

Paper – 3.11.2 : Advanced Statistical Methods for Business Decision  
Making

Time : 3 Hours

Max. Marks : 70

SECTION – A



Answer **any five** out of the following questions. **Each** question carries **5** marks.

(5×5=25)

1. Define Hypothesis. Explain the basics of hypothesis testing.
2. What is the difference between discrete and continuous probability distributions ?
3. Fit a linear regression model to the following data set :  $x = [2, 4, 6, 8, 10]$ ,  
 $y = [5, 7, 9, 11, 13]$ . Find the slope, intercept and R-squared value.
4. How do you estimate the logistic regression model ?
5. A retailer wants to determine whether a customer will make a purchase or not based on their age, gender and income. The dependent variable is "purchase" (1 = yes, 0 = no). Using logistic regression, build a model to predict the probability of purchase based on these three independent variables.
6. How do you decide the number of principal components to retain after performing PCA ?
7. What is Confirmatory Factor Analysis (CFA) ? How is it different from Exploratory Factor Analysis (EFA) ?

SECTION – B

Answer **any three** out of the following questions. **Each** question carries **10** marks.

(10×3=30)

8. Define chi-square distribution. Explain the application of it.
9. Mention the statistical tests for model stability. Explain different tests used.
10. What is the purpose of stepwise regression in logistic regression ? How does it work ?
11. Explain the steps involved in conducting a SEM analysis with suitable example.

P.T.O.



## SECTION – C

Case study (**Compulsory** question).**(1×15=15)**

12. A company is interested in understanding the relationship between the level of education and work experience of their employees and their salary. They collect data on 100 employees, including their level of education (high school, bachelor's degree, master's degree, or PhD), years of work experience, and salary. They want to use regression analysis to determine which factors are most strongly related to salary.
- What is the dependent variable in this case study ?
  - What is the independent variable in this case study ?
  - What type of regression analysis would be most appropriate for this case study ?
  - What are the assumptions of multiple linear regression ?
  - How would you interpret the coefficients in a multiple linear regression model ?
  - How would you assess the overall fit of a multiple linear regression model ?
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