



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.A. DEGREE EXAMINATION – ECONOMICS

FIRST SEMESTER – NOVEMBER 2016

16PEC1MC04 – MATHEMATICS AND STATISTICS FOR ECONOMICS

Date: 09-11-2016

Dept. No.

Max. : 100 Marks

Time: 01:00-04:00

PART A

Answer any FIVE questions in about 75 words each

(5 x 4 = 20)

1. Distinguish between small and large samples.
2. Find the total differential of $U = 2x^2y^3$.
3. What is a Characteristic Matrix? How is it derived?
4. State the Kuhn-Tucker conditions for optimisation.
5. For matrix $A = \begin{bmatrix} 4 & 3 \\ 3 & 2 \end{bmatrix}$ Prove that $AA^{-1} = A^{-1}A = I$.
6. State the conditions for consistency in case of Martin's rule.
7. What are the uses of Poisson distribution?

PART B

Answer any FOUR questions in about 300 words each

(4 x 10 = 40)

8. Find f_{xx} , f_{yy} , f_{xy} and f_{yx} given that $f(x,y) = 3x^3 + 2x^2y^2 + 5y^3 - 3$.
9. Examine the function $Z = 8x^3 + 2xy - 3x^2 + y^2 + 1$ for maximum, minimum and saddle points (if any.)
10. A man buys 50 electric bulbs of 'Philips' and 50 electric bulbs of 'HMT'. He finds the 'Philips' bulbs give an average life of 1500 hours with a standard deviation of 60 hours and 'HMT' bulbs gave an average life of 1512 hours with a standard deviation of 80 hours. Is there a significant difference in the mean life of the two makes of bulbs? (2.58 S.E at 1% level of significance).
11. Solve using Cramer's rule
 $2x + 3y + z = -3$
 $3x + 2z = 7$
 $x + 2y + z = 0$.
12. Explain the properties and importance of Binomial Distribution.
13. What are partitioned matrices? Explain the procedure for adding and multiplying a partitioned matrix.
14. Find A^2 where $A = \begin{bmatrix} 1 & 4 \\ 1 & 1 \end{bmatrix}$ and check that i^2 is the characteristic root of A^2 .

PART C

Answer any TWO questions in about 1200 words each

(2 x 20 = 40)

15. To test the significance of the variation of the retail prices of a commodity in three cities, Mumbai, Kolkata and Delhi, four shops were chosen at random in each city and prices observed in rupees were as follows:

Mumbai	16	8	12	14
Kolkata	14	10	10	6
Delhi	4	10	8	8

Do the data indicate that the prices in the three cities are significantly different? ($\alpha = 2$, $\beta = 9$, $F_{0.05} = 4.26$).

16. Elucidate the procedure of testing hypothesis.
17. Determine the point which maximises or minimises the function $U = x^2 + xy + y^2 + 3z^2$ subject to $x + 2y + 4z = 60$.
18. Explain the Game Theory Two Persons Zero Sum Game and enumerate the procedure for seeking solution using matrices.
