LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.A. DEGREE EXAMINATION – **ECONOMICS**

FIRSTSEMESTER – APRIL 2018

EC 1809- MATHS & STATISTICS FOR ECONOMISTS

Date: 30-04-2018 Dept. No. Max. : 100 Marks

Time: 09:00-12:00

PART – A

Answer any FIVE questions in about 75 words each (5 x 4 = 20)

1. Write a short note on open input-output model.
2. Distinguish between difference equations and differential equations with an example.
3. With the aid of a diagram depict the area of rejection and acceptance in a two-tailed test.
4. Distinguish between perfect positive correlation and perfect negative correlation.
5. 12 coins are tossed at the same time. What is the probability of getting 9 or more heads in a single toss?
6. Find 3A – 2B

   $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ $B = \begin{bmatrix} -1 & 2 \\ 2 & -1 \end{bmatrix}$

7. Find $|A|$ given $A = \begin{bmatrix} 2 & 5 & 4 \\ 0 & 4 & 3 \\ 6 & 8 & 10 \end{bmatrix}$

PART – B

Answer any FOUR questions in about 300 words each (4 x 10 = 40)

8. Solve the following set of simultaneous linear equations using Cramer's rule

   $5x - 6y + 4z = 15$

   $7x + 4y - 3z = 19$

   $2x + y + 6z = 1$

9. Elucidate the procedure for testing hypothesis.
10. Examine the function $y = x^3 - 3x^2 - 9x + 27$ for maximum and minimum values.
11. Find the inverse of $\begin{bmatrix} 5 & 2 & 1 \\ 2 & 1 & 4 \\ 0 & 5 & 6 \end{bmatrix}$
12. Explain the properties of Normal distribution.
13. Given $Z = x^2 - 2xy + y^2$, find the first and second order total differentials.

14. 1000 students at college level were graded according to their I.Q. and economic conditions. Use χ^2 to find out whether there is any association between economic condition and I.Q. (Given for $\nu = 1$, $\chi^2_{0.05} = 3.84$)

I.Q.

Economic condition	High	Low	Total
Rich	460	140	600
Poor	240	160	400
Total	700	300	1000

PART – C

Answer any TWO questions in about 1200 words each (2 x 20 = 40)

15. For the following average cost function, find the minimum average cost and show that at minimum average cost, marginal cost and average cost are equal.
$\bar{y} = 25 - 8x + x^2$

16. A test was given to 5 students chosen at random from M.Com class of each of the three universities in Bihar.

University	Scores				
A	90	70	60	50	80
B	70	40	50	40	50
C	60	50	60	70	60

Perform ANOVA and show if there is any significant difference between the scores of students in the three universities. (Given F 5% = 3.44).

17. Given $A = \begin{bmatrix} 0.1 & 0.3 & 0.1 \\ 0 & 0.2 & 0.2 \\ 0 & 0 & 0.3 \end{bmatrix}$ and $F = \begin{bmatrix} 20 \\ 0 \\ 100 \end{bmatrix}$, find the output levels.

18. Determine the point which 2inimizes or 2inimizes the function $U = x^2 + xy + y^2 + 3z^2$ subject to $x + 2y + 4z = 60$.

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