LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.A. DEGREE EXAMINATION - ECONOMICS

FIRST SEMESTER – NOVEMBER 2013

EC 1809 - MATHEMATICS & STATISTICS FOR ECONOMISTS

Date : 13/11/2013   Dept. No.   Max. : 100 Marks
Time : 1:00 - 4:00

Part – A

Answer any FIVE questions. Each question carries four marks.   (5 x 4 = 20)

1. Distinguish between triangular matrix and diagonal matrix.
2. Given the matrices A = $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ and B = $\begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix}$, Prove that AB $\neq$ BA.
3. If $y = \log x^4$, find $\frac{dy}{dx}$.
4. Find η, if price of a commodity is Rs. 8 and MR is Rs. 6.
5. From following information find the correlation between X and Y.
   $\sum dxdy = 26$, $\sum dx = 10$, $\sum dy = 4$, $\sum dx^2 = 62$, $\sum dy^2 = 42$, N = 8.
6. For a Binomial distribution with parameters n = 5, p = 0.3 find the probability of getting atleast 3 successes.
7. List out the procedure for Testing Hypothesis.

Part – B

Answer any FOUR questions. Each question carries ten marks.   (4 x 10 = 40)

8. Solve the following Linear Equations by using Cramer's Rule.
   $5x + 3y = 65$
   $2y - z = 11$
   $3x + 4z = 57$

9. Compute Cofactor for the Matrix A = $\begin{bmatrix} 5 & 2 & 1 \\ 2 & 1 & 4 \\ 0 & 5 & 6 \end{bmatrix}$ and also prove that $|A^T| = |A|$.

10. (a) Find all the partial derivatives of $z = x^3 + y^3 - 3xy$.
    (b) Find the total derivative of $z = (x^2 + y)(2x - y^2)$.

11. Compute coefficient of correlation between x and y from the following data.

X:	1	3	5	8	9	10
Y:	3	4	8	10	12	11

12. Compute the average seasonal movement for the following series by the method of simple average

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2006	318	281	278	250	231	216	223	245	269	302	325	347
2007	342	309	299	268	249	236	242	262	288	321	342	364
2008	367	328	320	287	269	251	259	284	309	345	367	394
2009	392	349	342	311	290	273	282	305	328	364	389	417

13. Explain the properties of normal distribution.

14. The three samples below have been obtained from normal populations with equal variances. Test the hypothesis that the sample means are equal.

X_1	X_2	X_3
8	7	12
10	5	9
7	10	13
14	9	12
11	9	14

The table value of F at 5% level of significance for $v_1 = 2$ and $v_2 = 12$ is 3.88.

Part – C

Answer any TWO questions. Each question carries twenty marks.   (2 x 20 = 40)

15. Solve the following set of Linear Simultaneous Equations by using matrix inversion technique.
    $2x_1 + 4x_2 - x_3 = 15$………..(1)
    $x_1 - 3x_2 + 2x_3 = -5$………..(2)
    $6x_1 + 5x_2 + x_3 = 28$………..(3)

16. Given the following Revenue (R) and Cost (C) functions for a firm $R = 20q + q^2$ and $C = q^2 + 8q + 2$
    (a) Find the equilibrium level of output, price at which profit is maximum, and
    (b) Find total revenue, total cost at that level of output.

17. Find out the following from given values of X and Y.
    (a) The two regression coefficients.
    (b) Coefficient of correlation.
    (c) Most likely value of X when Y = 12.
    (d) Most likely value of Y when X = 22.

X:	2	8	10	-2	5	-4
Y:	3	2	5	10	-2	-3

18. Calculate seasonal indices by the ratio to moving average method, from the following data.

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
2007	68	62	61	63
2008	65	58	66	61
2009	68	63	63	67

*****