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Name.....

Reg. No.....

FIRST SEMESTER M.A. DEGREE EXAMINATION, DECEMBER 2015

(CCSS)

Economics

ECO 1C 03—MATHEMATICS FOR ECONOMICS

(2013 Admission onwards)

Time : Three Hours

Maximum : 80 Marks

Section A

Answer all questions.

Choose the correct answer :

1. The number of rows and columns are called :

- (a) Order.
- (b) Size.
- (c) Dimension.
- (d) All of the above.

2. The ratio of explained variation to total variation is :

- (a) r .
- (b) r^2 .
- (c) $\bar{R}$.
- (d) None of the above.

3. A matrix is said to be a "Symmetric Matrix", if :

- (a) $a_{ij} = a_{ji}$.
- (b) $a_{ij} = -a_{ji}$.
- (c) $a_{ij} < a_{ji}$.
- (d) $a_{ij} > a_{ji}$.

4. $\frac{dy}{dx}$ is termed as :

- (a) Indefinite differential co-efficient.
- (b) Differential co-efficient.
- (c) Anti-differentiation co-efficient.
- (d) None of the above.

5. If $y = X^{10}$, then $\frac{dy}{dx}$:

- (a) x^9 .
- (b) $9x^{10}$.
- (c) $10 x^9$.
- (d) x^{10} .

Turn

6. $\int \frac{1}{x} dx = \log x + c :$

(a) Rule IV.

(c) Rule VIII.

(b) Rule VII.

(d) None of the above.

7. The term Regression is associated with :

(a) Fisher.

(c) Francis Galton.

(b) Karl Pearson.

(d) None of the above.

8. Poisson distribution is defined as :

(a) $P(r) = \frac{e^{-m} m^r}{r!}.$

(c) $P(r) = \frac{em^r}{r}.$

(b) $P(r) = \frac{e^m m}{r!}.$

(d) None of the above.

9. Bernoulli distribution is known as :

(a) Hypergeometric Distribution.

(c) Multinomial Distribution.

(b) Binomial distribution.

(d) None of the above.

10. Binomial expansion method is applicable when :

(a) The X variable advances by unequal intervals.

(b) The value of X for which Y is to be interpolated is one of the limits of X series.

(c) X variable advances by equal intervals and value of X for which Y is to be interpolated is one of the class limits of X series.

(d) None of the above.

$(x+x)^n$

(10 × 1 = 10 marks)

Section B

Answer any eight questions.
All questions carry equal marks.

11. Explain any five types of matrix. Give one example for each type.

12. Let $A = \begin{bmatrix} 3 & 6 \\ 7 & 0 \end{bmatrix}$, $B = \begin{bmatrix} -1 & 7 \\ 8 & 4 \end{bmatrix}$ and $C = \begin{bmatrix} 5 & 4 \\ 1 & 9 \end{bmatrix}$ verify that $(A + B) - C = A + (B - C)$.

13. What are the properties of determinants ?
14. If $m = n^3$ and $n = p^2 + 4$, find $\frac{dm}{dp}$.
15. If $U = x^3 + y^3 + z^3 - 3xyz$, prove that $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} + z \frac{\partial u}{\partial z} = 3U$.
16. Determine the maxima and minima of the function $y = x^3 + 5x^2 + 8x + 5$.
17. Evaluate $\int \frac{8x}{(x^2 - 5)^3} dx$.
18. Explain Lagrange multiplier method.
19. What are the salient features of multiple and partial regression ?
20. If ${}^nC_2 = 3$, find the value of 'n'.
21. A problem in Statistics is given to five students A, B, C, D and E. Their chances of solving it are $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}$ and $\frac{1}{6}$. What is the probability that the problem will be solved ?
22. The probability that a man fishing at a particular place will catch 1, 2, 3, 4 fish are 0.4, 0.3, 0.2 and 0.1 respectively. What is the expected number of fish caught ?

(8 × 5 = 40 marks)

Section C

*Answer any two questions.
All questions carry equal marks.*

23. Solve the following problem using Cramer's rule.

$$\begin{aligned} 2x + 3y + 5z &= -9 \\ x + 10y + 7z &= -13 \\ -5x + y + 10z &= 14. \end{aligned}$$

24. Explain the economic applications of partial and total differentiation.

Turn over

25. Find the coefficient of the correlation for the following :

Cost :	39	65	62	90	82	75	25	98	36	78
Sales :	47	53	58	86	62	68	60	91	51	84

26. The following data show the number of seeds germinating out of 10 on damp filter for 80 set of seeds. Fit a binomial distribution to this data :

X :	0	1	2	3	4	5	6	7	8	9	10
Y :	6	20	28	12	8	6	0	0	0	0	0

(2 × 15 = 30 marks)