THIRD SEMESTER B.A DEGREE EXAMINATION, NOVEMBER 2020

(CUCBCSS - UG)

CC15U ECO3 B03 - QUANTITATIVE METHODS FOR ECONOMIC ANALYSIS I

(Economics - Core Course)

(2015 to 2018 Admissions – Supplementary/Improvement)

Time: Three Hours   Maximum: 80 Marks

Section A (Objective Type Questions.)

Answer *all* questions. Each question carries 1 mark.

1. The equation $9x^2 - 6x + 1 = 0$ has

    a) Equal roots   b) unequal roots   c) imaginary roots   d) no roots

2. If A is a square matrix such that $A^T = A^{-1}$, then the matrix A is called _____

    a) Singular   b) idempotent   c) orthogonal   d) symmetric

3. The range of the simple correlation coefficient is

    a) -1 to 1   b) -1 to 0   c) 0 to1   d) $-\infty$ to ∞

4. The determinant of the null matrix is _____

    a) 3   b) 0   c) 1   d) 2

5. Data which are collected at a point of time is called

    a) Cross-sectiondata   b) time series data   c) pooled data   d) panel data

6. The indifference curve analysis is developed by

    a) Edgeworth   b) R. A Fisher   c) Cobb Douglas   d) Wilfred Pareto

7. If $f(x) = |x - 2|$ then $f(-2)$ is _____

    a) -2   b)-4   c) 2   d) zero

8. Slope of the equation $2x + 3y = 5$ is _____

    a) $\frac{3}{2}$ b) $\frac{5}{3}$ c) $\frac{-2}{3}$ d)$\frac{-3}{2}$

9. For percentiles, the total numbers of partition values are

    a) 90   b) 100   c)10   d) 99

10. Population growth can be found out using _____

    a) Mode   b) Median   c) Geometric mean   d) Harmonic mean

11. $ax + by + c = 0$ where a, b, c are constants is the general form of

    a) Parabola   b) quadratic function   c) polynomial   d) straight line

12. If the regression coefficients are 0.9 and 0.4 the value of correlation coefficient is...

   a) 0.36   b) 0.6   c) -0.6   d) zero

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(12 x ½ = 6 Marks)

Section B (Very Short Answer Type Questions)
Answer any **ten** questions. Each question carries 2 marks.

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13. Define quartile deviation.

14. Solve $((x^2)^{-2})^{-2} \times (x^{-3})^2$.

15. Find the rank of the matrix $A = \begin{bmatrix} 5 & 2 & 1 \\ 0 & 1 & 3 \\ 2 & 1 & 0 \end{bmatrix}$

16. What are Deciles?

17. What is Gini Coefficient?

18. Find the number of digits in 6^{10}.

19. Distinguish between negative and positive correlation.

20. Define singular matrix.

21. Find the solution of the equations $y = x^2 \ and \ y = 4$ graphically.

22. Define kurtosis.

23. If the CV of a distribution is 50 and its SD is 20. What will be the value of AM?

24. Find the breakeven point given $R(x) = 9x - x^2 \ and \ C(x) = 4x - 6$.

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(10 x 2 = 20 Marks)

Section C (Short Answer Type Questions)
Answer any **six** questions. Each question carries 5 marks.

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25. Define Lorenz curve for a continuous distribution and its practical applications in economics.

26. Distinguish between indifference curves and isoquants.

27. Show that $A^2 - 3A + 2I = 0, where \ I$ is the identity matrix if $A = \begin{bmatrix} 1 & 0 & -2 \\ 2 & 2 & 4 \\ 0 & 0 & 2 \end{bmatrix}$

28. Solve the system of equations using crammer's rule.

$$2x + 3y - 1 = 0 \ ; \ 3x + y - 5 = 0$$

29. Calculate quartiles for the given data

Classes	30-35	35-40	40-45	45-50	50-55	55-60	60-65
Frequency	10	16	18	27	18	8	3

30. Calculate coefficient of variation of the following data.

Classes	0-4	4-8	8-12	12-16	16-20
frequency	3	8	17	10	2

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31. What is a scatter diagram? How is it useful to explain the correlation between two variables?

32. Simplify $\dfrac{(xy)^4(x^{-1}y)^2(x^2y)^{-3}}{(x^{-3}y^{-6})^{\frac{1}{3}}} \times \left(\dfrac{x^6}{y^{10}}\right)^{\frac{1}{2}}$

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(6 x 5 = 30 Marks)

Section D (Essay Type Questions)
Answer any **two** questions. Each question carries 12 marks.

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33. For the following data find the two regression lines, regression coefficients, correlation coefficient and also find the expected value of y when x=34.

x	28	41	40	38	35	33	40	32	36	33
y	23	34	33	34	30	26	28	31	36	38

34. Calculate Karl Pearson's coefficient of skewness for the following frequency distribution and explain its significance.

Class	65-69	70-74	75-79	80-84	85-89	90-94	95-99	100-104
Frequency	8	15	18	25	14	9	6	5

35. The marks of 10 students in two tests are given below. Calculate the rank correlation coefficient and comment.

Test 1:	68	64	75	50	64	80	75	40	55	64
Test 2:	62	58	68	45	81	60	68	48	50	70

36. Solve the system of equations using matrix inversion method.

$$a + 10b + 40d = 6950; \quad a + 9b + 35d = 6725; \quad a + 12b + 40d = 7100$$

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(2 x 12 = 24 Marks)

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