FIRST SEMESTER M.A. DEGREE EXAMINATION, NOVEMBER 2020

(CBCSS-PG)

(Regular/Supplementary/Improvement)

CC19P ECO1 C04 – QUANTITATIVE METHODS FOR ECONOMIC ANALYSIS - I

(Economics)

(2019 Admission onwards)

Time: Three Hours   Maximum: 30 Weightage

Part A

Answer *all* questions. Each question carries 1/5 weightage.

1. $(A^T)^T =$

   (a) adj(A)   (b) A^{-1} (c) A^T (d) A

2. The value of log e is

   (a) 0   (b) 1   (c) e   (d) none of these

3. $\int (1/x)dx =$

   (a) 0   (b) log x   (c) 1   (d) x

4. A square matrix is symmetric if A =

   (a) A^T (b) $-A^T$ (c) 1   (d) none of these

5. The finite difference given by $\Delta y_{t+1} - \Delta y_t$ is called

   (a) First finite difference   (b) Second finite difference

   (c) Third finite difference   (d) None of these

6. Trace of a matrix $\begin{bmatrix} 3 & 5 & 2 \\ -7 & 0 & 8 \\ 2 & 4 & 8 \end{bmatrix}$

   (a) 0   (b) 11   (c) 12   (d) 10

7. $\frac{d}{dx}(3) =$

   (a) 0   (b) 3   (c) 2   (d) 2x

8. The value of $\int_0^1 e^x dx =$

   a) $e - 1$ (b) $e + 1$ (c) e   (d) 0

9. If $y = e^{2x}$ then $\frac{d^2x}{dy^2} =$

   (a) $4e^{2x}$ (b) e^{2x} (c) e   (d) none of these

10. $4x - 3y = 0$ then $\partial f / \partial y =$

    (a) 3   (b) -3   (c) 0   (d) 4

11. Elasticity of demand for the demand function $q = 27/p^3$ is

    (a) 2   (b) 3   (c) e   (d) 1

12. If MR is 25 and the elasticity of demand with respect to price is 2 then the AR is

    (a) 1/50   (b) 50   (c) 1/25   (d) 25

13. Value of $\begin{vmatrix} 2 & 4 & 3 \\ 3 & 1 & 2 \\ 6 & 2 & 4 \end{vmatrix}$

    (a) 0   (b) 1   (c) 12   (d) none of these

14. $\frac{d}{dx}(\log x) =$

    (a) 1   (b) x   (c) 1/x   (d) e^x

15. The order of the matrix $\begin{bmatrix} 2 & 1 & 0 \\ 1 & 5 & 2 \end{bmatrix}$

    (a) 3x2   (b) 2x3   (c) 2x2   (d) 3x3

(15 x 1/5 = 3 Weightage)

Part B (Very short answer questions)

Answer any *five* questions. Each question carries 1 weightage.

16. Define price elasticity of demand.

17. If D = 250 – 50p and S = 25p + 25 are demand and supply function, Calculate equilibrium price.

18. Find the rank of the matrix $\begin{bmatrix} 3 & -1 & 2 \\ -6 & 2 & 4 \\ -3 & 1 & 2 \end{bmatrix}$

19. Write any four properties of determinations.

20. How do you determine the maximum and minimum value of a function?

21. What is the rank of a matrix?

22. The fourth term of a GP is 56 while the sixth term is 7/8, Find the GP.

23. Show that $\begin{vmatrix} 1 & a & a^2 \\ 1 & a & b^2 \\ 1 & a & c^2 \end{vmatrix} = (a-b)(b-c)(c-a)$

(5 x 1 = 5 Weightage)

Part C (Short answer questions)

Answer any *seven* questions. Each question carries 2 weightage.

24. Solve $\frac{dy}{dx} + \frac{x}{y} = 0$. Find also particular solution when $x = 2, y = 1$

25. Write notes on:

    (a) Marginal Reverence   (b) Marginal Cost

    (c) Average Reverence   (d) Average Cost

26. Integrate (a). $(x + 1)^5$, (b). $(x^2 +1)^3$

27. Describe the application of differentiation in economics.

28. If the total cost is $C = 25q^2 + 10q + 50$, find the average cost and marginal cost when q = 1.5.

29. Find the characteristic equation and characteristic roots of the matrix $\begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$

30. Find $\frac{dy}{dx}$ (a) $e^x \log x$ (b) $\frac{(3x+1)(x-2)}{(x-1)(3x+2)}$ (c) $e^x + (x+1)^{3/2}$

31. Evaluate $\int \log x \, dx$

32. Find the inverse of $\begin{bmatrix} 3 & 5 & 7 \\ 2 & -3 & 1 \\ 1 & 1 & 2 \end{bmatrix}$

33. Find the maximum and minimum value of the function $4x^3 + 9x^2 - 12x + 13$

(7 x 2 = 14 Weightage)

Part D (Essay questions)

Answer any *two* questions. Each question carries 4 weightage.

34. Integrate (a). $(4x + 5)/(2x^2 + 5x + 2)$,   (b). $x^2 e^{3x}$

35. Find the first and second order partial derivatives of $U = x^2y + xy^2$

36. The marginal revenue function of a product is MR = 20q. Find the price of the product when q = 10. Also find how much price will change when q increases to 20.

37. Solve the system of equations

        2x – y + 3z = 9

        x + y + z = 6

        x – y + z = 2

(2 x 4 = 8 Weightage)

****

(3)