

QP CODE: 24019101

M A DEGREE (CSS) EXAMINATION , APRIL 2024

Second Semester

MA ECONOMETRICS

CORE - EM010204 - MATHEMATICAL METHODS FOR ECONOMETRIC ANALYSIS-2

2019 Admission Onwards

E0A83F97

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

Answer any eight questions.

Weight 1 each.

- 1. Define Lagrangian function.
- 2. How the degree of homogeneity is related to returns to scale.
- 3. Define homothetic functions.
- 4. Explain standard form of an LP problem.
- 5. What do you mean by compact sets and open sets ?

Given the boundary condition y = 18 when x = 6, evaluate $y = \int 4dx$

Using substitution method, evaluate $\int rac{4w+3}{4w^2+6w-1} \; dx$ 7.

8. What is riemann integral?

6.

9. Find the order and degree of the following differential equations

(i)
$$\left(\frac{d^2y}{dx^2}\right)^2 + \cos\left(\frac{dy}{dx}\right) = 0$$

(ii) $\cos x \left(\frac{dy}{dx}\right) + y . \sin x = \tan^2 x$

10. State the general formula for solving first order difference equations.

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(8×1=8 weightage)





Reg No 2 :

Name



Part B (Short Essay/Problems)

Answer any six questions.

Weight 2 each.

- 11. Explain the concept of Global extrema.
- 12. Explain the Envelope theorem with respect to Unconstrained Optimization problems.
- 13. What are KKT conditions and when its used? Discuss on NDCQ and use of Jacobian matrix to check constraints qualification.
- 14. Explain investment and capital formation as an application of integration.
- 15. Use the technique of integration by parts to find the integral

$$\int x \cos x \, dx$$
$$\int e^x \sin x \, dx$$
$$\int 4x \cos(2 - 3x) \, dx$$

16. Discuss the different forms of rational functions and the corresponding form of partal fractions in detail.

17.
$$\displaystyle rac{d^2y}{dx^2} = \sin^2 x + x. \, e^x$$

18. Find the general solution of :

$$y_{t+2} - 11y_{t+1} + 25y_t = 8$$

(6×2=12 weightage)

Part C (Essay Type Questions)

Answer any two questions.

Weight 5 each.

- 19. Discuss elaborately any two economic applications of Unconstrained optimization.
- 20. What is the purpose of graphical method? What are the types of solutions using graphical method? What do you mean by optimum points?
 Maximise and minimise z = 4x + y
 subject to x + y ≤ 50,
 3x + y ≤ 90, x & y greater than zero.
- 21. Explain Harrod model as an application of Integral calculus.
- 22. Write a short note on Samuelson Multiplier Accelerator Model.

(2×5=10 weightage)

