

21U307

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Name: .....

Reg.No: .....

**THIRD SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2022**

(CBCSS - UG)

(Regular/Supplementary/Improvement)

**CC19U MEC3 C03 - MATHEMATICAL ECONOMICS**

(Statistics - Complementary Course)

(2019 Admission onwards)

Time : 2.00 Hours

Maximum : 60 Marks

Credit : 3

**Part A** (Short answer questions)

Answer *all* questions. Each question carries 2 marks.

1. Find the order and degree of the differential equation

i)  $\frac{dy}{dt} = 10x + 5$

ii)  $\left(\frac{dy}{dx^2}\right)^6$

2. What is difference equation?

3. Find AP and MP for the following table of production of wheat .

Land(B)	10	10	10	10	10	10	10	10	10	10
Labour(A)	1	2	3	4	5	6	7	8	9	10
Total Production(TP)	8	10	12	10	5	3	2	0	-5	-10

4. Define Law of Diminishing returns.

5. State the assumptions of Isoquants.

6. Discuss producer's equilibrium.

7. What is elasticity of substitution?

8. Define Euler's theorem.

9. What is constant returns to scale?

10. Explain investment decisions.

11. Explain the advantages and limitations of IRR method.

12. If two projects have the same expected value with different standard deviation ,which one is more risky?

**(Ceiling: 20 Marks)**

**Part B** (Short essay questions - Paragraph)

Answer *all* questions. Each question carries 5 marks.

13. Find the demand function  $Q=f(p)$  if  $e = -(5P+2P^2)/Q$  and  $Q = 500$  when  $P = 10$ .

14. What do you mean by the stability condition in difference equations?
15. Find the expansion path of Cobb-Douglass production function.
16. What are the advantages of C.E.S production function over Cobb-Douglass production function?
17. Optimize the Cobb-Douglass production function  
 $q = K^{0.3}L^{0.5}$  subject to  $6K + 2L = 384$
18. Optimize the C.E.S production function  
 $P = 80[0.4k^{-0.25} + (1 - 0.4)l^{-0.25}]^{-1/0.25}$   
 Subject to the constraint  $5k + 2l = 150$
19. Briefly explain simulation approach.

**(Ceiling: 30 Marks)**

**Part C (Essay questions)**

Answer any *one* question. The question carries 10 marks.

20. Find the integrating factor and solve the differential equation  $t^2 dy + 3ytdt = 0$
21. i) What is certainty equivalent approach method?  
 ii) Find NPV of the following cash flows of a project. Use 12% as discount factor

Year	0	1	2	3	4	5	6	7
Cash in flows(Rs.)	-20000	5000	5000	6000	7000	8000	9000	1000

**(1 × 10 = 10 Marks)**

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