Unit I:-

Topics: Functions of several variables, Partial differentiation, Homogeneous functions, Euler's theorem for homogeneous functions.

Problems:

- Q.3 Exercise 2.2 (on page 2.30) (J&I)
- Solved Example 2.22 & 2.23 (on page 2.33) (J&I)
- Q. 1- 13/Exercise 2.3 (on page 2.44) (J&I)
- Verify Euler's theorem in the following cases

(i) $f(x,y)=\frac{\left(x^{\frac{1}{4}}+y^{\frac{1}{4}}\right)}{\left(x^{\frac{1}{5}}+y^{\frac{1}{5}}\right)}$ (ii) $f(x,y)=\frac{(x^2-3xy)}{(x+y)}$

- Solved Example 2.26 (on page 2.36) & 2.27(on page 2.37) (J&I)
- Q. 29—33/Exercise 2.3 (on page 2.45) (J&I)
- Q. 6 & 7 /Example 25(on page 145) and Q. 15 & 18/Example 25(on page 147) (Chandrika Prasad)

Topics: Total differential coefficient, Change of variables.

Problems:

- Q. 16—20/Exercise 2.2 (on page 2.31) (J&I)
- Q. 26—30/Exercise 2.2 (on page 2.31) (J&I)
- Q. 3, 6, 7, 12, 13 &14/ Example 27(on page 158-59) (Chandrika Prasad)

Topics: Jacobian: Definition and its properties

Problems:

- Solved example 2.19 (on page 2.27) and 2.20(a) (on page 2.28) (J&I).
- Q. 1-8/ Example 28(on page 161-162) (Chandrika Prasad)

Topic: Taylor series for a function of two variables

Problems:

- Q. 36-40/Exercise 2.3 (on page 2.45) (J&I)

Topic: Error and Approximations

Problems:

- Q. 4—9/ Example 29(on page 165-66) (Chandrika Prasad)
- Q. 48-52/Exercise 2.2 (on page 2.32) (J&I)

Topics: Maxima and minima of function of two variables: 2nd derivative test

Problems:

- Q. 1-6/ Exercise 2.4 (on page 2.54) (J&I)
- Q. 5, 7, 8 & 15/ Example 30 (on page 174-75) (Chandrika Prasad)

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AMS 1122 **Lecture Plan**

Unit II:-

Topics: Evaluation of double integral by two successive integrations, Properties of double integrals, Applications of double integrals in area , volume, centre of gravity and moment of inertia.

Problems:

- Q. 1-16 Example 55 (on page 307) (Chandrika Prasad)
- Solved Example 2.41 (on page 2.60) & 2.42 (on page 2.61) (J&I)
- Q. 1-4 & 11- 20/Exercise 2.5 (on page 2.75 & 2.76) (J&I)
- Q. 1-19 Example 56 (on page 310) (Chandrika Prasad)
- Solved Example 2.46 (on page 2.63) (J&I)
- Solved Example 1 (on page 325 & 330) (Chandrika Prasad)
- Q. 1-5 & 16,18,19 Example 60 (on page 334) (Chandrika Prasad)

Topics: Change of variables, Change of order of integration in double integrals.

Problems:

- Solved Example 2.51-2.53 (on page 2.70) (J&I)
- Q. 5 & 6—10/Exercise 2.5 (on page 2.76) (J&I)
- Q. 1-20 Example 57 (on page 315) (Chandrika Prasad)
- Q. 1-17 Example 58 (on page 320) (Chandrika Prasad)

Topics: Evaluation of triple integrals, Change of variables in triple integrals, Applications of triple integrals.

Problems:

- Solved Example 2.47-2.50 (on page 2.70) (J&I)
- Q. 1-12/Example 59 (on page 323) (Chandrika Prasad)
- Solved Example 2 (on page 325) (Chandrika Prasad)
- Q. 8, 9 & 20 Example 60 (on page 334) (Chandrika Prasad)

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Unit 3:-

Topics: Basic theory of Laplace Transform, Laplace Transform of elementary functions, Inverse Laplace Transform

Problems:

- Example 8.1-8.5 (on page 8.2 & 8.3) (J&I)
- Q. 1- 10/Exercise 8.1 (on page 8.6) (J&I)
- Q. 19—22/Exercise 8.1 (on page 8.6) (J&I)
- Q. 31—40/Exercise 8.1 (on page 8.6 & 8.7) (J&I)

Topics: Laplace Transform of derivatives, Laplace Transform of Integrals, Translation Theorem (First Shifting Property)

Problems:

- Example 8.16, 8.17 & 8.22 (on page 8.11, 8.12 & 8.15) (J&I)
- Q. 1—19/Exercise 8.2 (on page 8.13) (J&I)
- Q. 1—21/Exercise 8.3 (on page 8.22) (J&I)

Topics: Differentiation of Laplace Transform, Integration of Laplace Transform, Unit Step Functions, Translation Theorem (Second Shifting Property)

Problems:

- Example 8.32, 8.33 & 8.37 (on page 8.29 & 8.33) (J&I)
- Q. 10—22/Exercise 8.4 (on page 8.38) (J&I)
- Q. 32—42/Exercise 8.4 (on page 8.38) (J&I)
- Q. 29—52/Exercise 8.3 (on page 8.23) (J&I)

Topics: Periodic Functions, Convolution Theorem

Problems:

- Q. 2, 3, 6, 8 /Exercise 8.5 (on page 8.43) (J&I)
- Q. 46—55/Exercise 8.4 (on page 8.38) (J&I)

Topic: Applications to linear differential equations (Initial Value Problems)

Problems:

- Q. 23—36/Exercise 8.2 (on page 8.13) (J&I)
- Q. 22—28/Exercise 8.3 (on page 8.22)
- Q. 23—31/Exercise 8.4 (on page 8.38) & Q. 58—64/Exercise 8.4 (on page 8.39) (J&I)
- Q. 53—65/Exercise 8.3 (on page 8.24) (J&I)
- Q. 14—20/Exercise 8.5 (on page 8.44) (J&I)

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Unit IV:-

Topics: Fourier series, Fourier coefficients, Fourier series of even and odd functions, Convergence of Fourier series, Theorem 9.1.

Problems:

- Solved Example 9.1-9.5 (J&I)
- Q. 01—35/Exercise 9.1 (on page 9.13-9.14) (J&I)

Topics: Fourier Half-Range series: Fourier cosine series, Fourier sine series
Introduction to Fourier transform

Problems:

- Solved Example 9.6-9.7 (J&I)
- Q. 01—15/Exercise 9.2 (on page 9.21) (J&I)

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