**Integral Calculus and Ordinary Differential Equation (Mid)**

Calculus– James Stewart - 8th edition

**Syllabus for Midterm exam** - Indefinite Integrals; Definite Integrals; Riemann Sum and Trapezoidal rule; Applications of Integration; Improper Integrals, Gamma and Beta Functions; Techniques of Integration.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Topics | Sub topics and Example | Exercise | Number of Lectures | Quiz |
| Indefinite Integrals (Chapter 5, page- 402) | Table of integrals (P-403) | P-408 Ex # 5-18 | 2 |  |
|  | Substitution rules (P-412)  Example # 1, 3, 5, 6, 8 | P-418 Ex # 7 - 13, 15, 18, 20, 21, 27, 31, 32, 43, 44 |  |  |
| Definite Integrals | Fundamental Theorem of Calculus (P-396) Example (P-396) # 5,6,7 | P-400 Ex # 19, 23, 24, 25, 27, 29, 35, 43  P-409 Ex # 21 - 30 |  |  |
|  | Substitution for definite Integrals (P – 416) Example # 7, 8, 9 | P- 419 Ex # 53, 54, 55, 59, 60, 70, 71 | 3 | Quiz1 |
| Properties of definite integrals | Even and odd functions (P-17) Example # 11, (P-417) Example # 10,11  Properties of D. I. (P-385 to 387) Example # 6 | P- 419 Ex # 61, 66, P-422 Ex # 22, 23 |  |  |
| Riemann Sum (P-379) and Trapezoidal rule (P-514) | P-381 Example # 2(a)  P-516 Example # 1 | P- 388 Ex # 1, 3, 7, 9  P- 524 Ex # 7, 8, 9 (n= 4, 6) LRS, RRS, MRS, TR  P-435 Ex # 48, 49  P-435: 48, 49 | 1 |  |
| Applications of Integration (Chapter – 6) | Area (P- 428) Example # 1, 2, 6, 7 | P- 434 Ex # 1, 3, 5 – 9, 13, 14, 17, 18, 22 | 3 |  |
|  | Volume (P-438) Example # 2, 3, 4 | P- 446 Ex # 1-10 |  | Quiz2 |
|  | Work (P-456) Example # 2, 3 | P- 459 Ex # 8 |  |  |
| Improper Integrals, Gamma and Beta Functions | Note will be provided |  | 1 |  |
| Techniques of Integration (Chapter -7) | Integration by parts (P-472) Example # 1, 2, 3, 4, 5 | P – 476 Ex # 1, 3, 5, 7, 9,11,12,17, 23 |  |  |
|  | Trigonometric Integrals (P-479) Example # 3, 4, 9 | P- 484 Ex # 7, 11, 23,24, 35, 39, 41, 43, 45, 46 |  |  |
|  | Trigonometric Substitution (P-486) Example # 1, 3, 7 | P – 491 Ex # 1-4, 6, 10-14, 21, 23 | 4 | Quiz3 |
|  | Partial Fraction (P-493) Example # 2, 3, 5 | P-501 Ex # 9-12, 19, 20, 23, 24, 25 |  |  |