Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_\_

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**End Semester Examination – Nov/Dec– 2018**

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| **Code :** | **11MA202/12MA202/MA245** | **Duration :** | **3hrs** |
| **Sub. Name :** | **MULTIPLE INTEGRALS, DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | **Marks** |
| **PART-A(10X1=10 MARKS)** | | |
| 1. | Evaluate | 1 |
| 2. | Change the order of integration of I = . | 1 |
| 3. | The value of ( ½ ) = \_\_\_\_\_\_\_\_\_ | 1 |
| 4. | β (3,2)=\_\_\_\_\_\_ | 1 |
| 5. | Solve (D2 – 2D + 1) y = 0. | 1 |
| 6. | Solve (D2 -1) y = | 1 |
| 7. | If . | 1 |
| 8. | is solenoidal if div=\_\_\_\_\_\_\_ | 1 |
| 9. | State initial value theorem. | 1 |
| 10. | Find . | 1 |

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| **PART B(5 X 3= 15 MARKS)** | | |
| 11. | Draw the region of integration in . | 3 |
| 12. | Evaluate. | 3 |
| 13. | Solve (D2- 4)y = sin2x | 3 |
| 14. | Find if = x2 -y2- z2 at (1, 2, 3). | 3 |
| 15. | Find L (t sint). | 3 |

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| **PART C(5 X 15= 75 MARKS)** | | | |
| 16. | a. | Evaluate | 8 |
| b. | Find the area between the parabolas y2 = 9x and x2 = 9y. | 7 |
| (OR) | | | |
| 17. | a. | Change the order of integration of I = . | 8 |
| b. | Find the volume of the tetrahedran bounded by the plane x+y+z=1and the coordinate planes x=0,y=0 and z=0. | 7 |
| 18. | a. | Prove that. | 10 |
| b. | Evaluate | 5 |
| (OR) | | | |
| 19. | a. | Evaluate where A is the area enclosed by x=0, y=0 and x+y = 1 where p, q are positive. | 8 |
| b. | Find the value of | 7 |
| 20. | a. | Solve , by the method of variation of parameters. | 8 |
| b. | Solve | 7 |
| (OR) | | | |
| 21. | a. | Solve (x2D2- 3x D)y = x+11. | 8 |
| b. | Solve | 7 |
| 22. | a. | Verify Gauss Divergence theorem for taken over the cube bounded by planes x = 0, x=1, y = 0, y =1, z =0 and z = 1. | 15 |
| (OR) | | | |
| 23. | a. | Find the angle between the surfaces z = x2+y2-3 and x2+y2+z2 = 9 at (2, -1, 2). | 8 |
| b. | Show that is irrotational and hence find its scalar potential. | 7 |
| 24. | a. | Using convolution theorem find the inverse Laplace transform of . | 8 |
| b. | Find the Laplace transform of the function  f(t) = t for 0 < t < a  2a-t for a < t < 2a  f(t+2a) = f(t). | 7 |
| (OR) | | | |
| 25. | a. | Solve y″ + 5y′ + 6y =2 given y(0) = y′(0) = 0, using Laplace transform technique. | 8 |
| b. | Find the Laplace transform of t2 e-t cost. | 7 |