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**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

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

**End Semester Examination – Nov/Dec - 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **11MA204/12MA204** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **MATRICES, DIFFERENTIAL EQUATIONS AND CALCULUS II** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | **Marks** |
| **PART-A(10X1=10 MARKS)** | | |
| 1. | Find the sum of the Eigen values of . | (1) |
| 2. | What is the third Eigen value of the matrix  if 3 and 15 are the other Eigen values. | (1) |
| 3. | Find the complementary function of | (1) |
| 4. | Find the particular Integral of | (1) |
| 5. | The volume of a region of space V is given by\_\_\_\_\_\_\_\_\_\_. | (1) |
| 6. | Sketch the region of integration . | (1) |
| 7. | If Curl= 0 then  is said to be \_\_\_\_\_\_\_\_\_\_. | (1) |
| 8. | Define Solenoidal Vector. | (1) |
| 9. | If , then find . | (1) |
| 10. | What is the value of . | (1) |

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| **PART B(5 X 3= 15 MARKS)** | | |
| 11 | State Cayley Hamilton Theorem | (3) |
| 12 | Solve | (3) |
| 13 | Evaluate . | (3) |
| 14 | If  find grad at (1, 1, 1). | (3) |
| 15 | If and find. | (3) |

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| **PART C(5 X 15= 75 MARKS)** | | | |
| 16. | a. | Verify Cayley-Hamilton theorem and hence find A−1 if A= | 15 |
| (OR) | | | |
| 17. | a. | Find the eigen values and eigenvectors of the matrix . | 15 |
| 18. | a. | Solve (x2D2 – xD + 4) y = x2 sin (logx). | 15 |
| (OR) | | | |
| 19. | a. | Solve the equation , by the method of variation of parameters. | 15 |
| 20. | a. | Evaluate  where V is the volume of the rectangular parallelepiped bounded by , , , , , . | 15 |
| (OR) | | | |
| 21. | a. | Evaluate and indicate the region of integration. | 15 |
| 22. | a. | Find the angle between the surfaces x2-y2-z2 = 11 and xy+yz-zx *=* 18 at the point (6, 4, 3). | 8 |
| b. | Find the directional derivative of  at the point in the direction of  **.** | 7 |
| (OR) | | | |
| 23. | a. | Show that is irrotational and hence find its scalar potential. | 8 |
| b. | If  find , | 7 |
| 24. | a. | Expand  in Taylor’s Series about (0,π/2) upto third degree. | 15 |
| (OR) | | | |
| 25. | a. | If , then find | 15 |

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