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**MLR15**

**Code No: A10009**

**MLR INSTITUTE OF TECHNOLOGY**   
(An Autonomous Institution)   
B.Tech I Year II Sem Examinations- June-2016

**MATHEMATICS-II**(Common to All Branches)

Time : 3 hours Max.Marks :75

Note: 1. This question paper contains two parts A and B.   
 2. Part A is compulsory which carries 25 marks. Answer all Questions in part A.   
 3. Part B consists of 5 units. Answer any one full question from each unit. Each question carries 10   
 Marks and may have a,b,c as sub questions.

**PART-A**  **25 Marks**

1. a) State Cayley- Hamilton theorem 2M

b) Find Eigen values of the matrix A= 2M

c) Form the partial differential equation by eliminating the arbitrary function “f” from

2M

d) Find the Fourier coefficient for f(x) =x in (-π, π) 2M

e) Find the finite Fourier sine transform of f(x) defined by f(x) =x where 0<x<4 2M

2. a) Find the rank of the matrix A by reducing it to the normal form where   
 A=  3M

b) Identify the nature of the quadratic form 3M

c) Solve   3M

d) Expand the function f(x) =x2 as a Fourier series in [-π, π] 3M

e) Find 3M   
 **PART-B 5x10=50** Marks

3. a) Find the inverse of the matrix A using Gauss-Jordan method A= 5M

b) Find the whether the following system of equations are consistent. If so solve them

5M

**OR**

4. a) Solve the equations    using   
 Gauss- Elimination method. 5M

b) Verify Cayley- Hamilton theorem for the matrix A= and hence find A-1 5M

5. a) Find Eigen values and Eigen vectors of the matrix A= 5M

b) Reduce the Quadratic form  to canonical form by orthogonal transformation. 5M

**OR**

6. a) Prove that Eigen values of a Hermitian matrix are real 5M

b) Diagonalize the matrix A= 5M

7. a) Form the partial differential equation by eliminating the arbitrary function from   
 z=y f(x2+z2) 5M

b) Solve  5M

**OR**

8. a) Solve  5M

b) Solve where u(x, 0) =6e-3x by the method of separation of variables 5M

9. a) Find the Fourier series of the function  in 5M

b) Find the half range cosine series and sine series for f(x) =x in 0<x< π and hence deduce that 5M

**OR**

10. a) Find the half-range sine series for 5M

b) Find the half-range cosine series for in and hence find the sum of the series 5M

11. a) Find the Fourier transform of f(x) defined by 5M

b) Find the Infinite Fourier sine transform of 5M

**OR**

12. a) Find 5M

b) Solve the difference equation using Z- transform where  5M

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