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(06 Marks)

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substitution  $X = x2 Y = y^2$ 



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15IVIAT:  
**Module-1**  
a. Obtain- the partial differential equation by eliminating the arbitrary function gig 
$$2y(X) + X(13(y))$$
 (05 Marl  
b. Solve  $\frac{27}{-x}$  subject to the conditions  $a^{(2)} = \log(1 + y)$  when x  $\cdot$  1 and z = 0 when x  
C Derive one dimensional heat equation in the form  $\frac{Q_1}{at} = c^2 \frac{a^2}{at}$  (06 Marl s)  
**OR**  
6 a. Obtain the partial differential equation given  $\left[\frac{XY}{z} = \overline{u}\right]$  (05 Marl  $\cdot$   
b. Solve  $\frac{a^2z}{ax^2} - \frac{3}{4x} - 4z = 0$  subject to the conditions that z = 1 and  $\frac{az}{bx} = y$  when x = 0.  
(05 Marl  $\cdot$   
b. Solve  $\frac{a^2z}{ax^2} - \frac{3}{4x} - 4z = 0$  subject to the conditions that z = 1 and  $\frac{az}{bx} = y$  when x = 0.  
(05 Marl  $\cdot$   
c. Obtain the solution of one dimensional wave equation  $\frac{b^2 u}{ath} = c^2 \frac{a}{2} \frac{v}{u}$  by the method separation of variables for the positive constant.  
(06 Mart. 0)  
**Module-1**  
7 a. Evaluate  $1 = \frac{a}{b} + \frac{1}{b} + \frac{1}{b}$ 

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## 15MAT21

(05 Marks)

## Module-5 cos 2t -cos3t

9	a. Find the Laplace transform of t-2		$+ t \sin t$ .	(05 Marks)	
	b. Express the function $f(t) =$	t, ( sin t,	$0 < t < \pi$ t >	in terms of unit step fur	nction and hence find
	its Laplace transform.				(05 Marks)

C. Solve y'' + 6y' + 9y'.  $^{-3t}$  subject to the conditions, y(0) = y'(0) by using Laplace transform. (06 Marks)

## **OR** 7s + 4

10 a. Find he inverse Laplace form of  $4s^{-} + 4s + 9$ 

b. Find the Laplace transform of the full wave rectifier  $f(t) = E \sin \cot 0 < t < Tt/to having period 7t/to.$  (05 Marks)

C. Obtain the inverse Laplace transform of the function  $\begin{pmatrix} 1 \\ (s-1)(s^2+1) \end{pmatrix}$  by using convolution theorem. (06 Marks)

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