Reg. No.									
----------	--	--	--	--	--	--	--	--	--



Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)

IV SEMESTER B.TECH (PRINTING & MEDIA ENGINEERING) END SEMESTER MAKE-UP EXAMINATIONS, JUNE 2016

SUBJECT: ENGINEERING MATHEMATICS IV [MAT 2212]

REVISED CREDIT SYSTEM

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ✤ Answer ALL the questions.
- Missing data may be suitable assumed.

	A variate X has the following probability distribution:							
		Х	-3	6	9			
		P(X=x)	1	1	1			
1A.			$\overline{6}$	$\overline{2}$	$\overline{3}$		3Marks	
	Find $E(X)$ and $V(X)$.							
1B.	In a normal distribution 13% of the items are under 45 and 42% over 64. Find the						3Marks	
	mean and standard deviation Use simplex method to solve Maximize $z = 4x \pm 10y$ subject to $2y \pm y \le 50$							
1C.	2x+5y ≤ 100, 2x+3 y ≤ 90, $x \ge 0$, $y \ge 0$						4Marks	
	(1) If $A = A = D$ and $A = A = A = A = A = A = A = A = A = A $							
2A.	(i) If A and B are independent and $P(A) = 1/2$, $P(B) = 1/3$ then $P(A \cap B) =(ii) In the roll of an ideal die, the probability of getting a prime number is$							
	(iii) The mean of the binomial distribution is							
	Let X be a binomial distribution with mean 2 and standard deviation $2 / \sqrt{3}$. Find							
2B.	'n'and'p'.							
	Solve	Solve $y'' + y + 1 = 0$ with $y(0) = y(1) = 0$ and $h = 0.25$ by finite difference method						
2C.	Solve $y + y + 1 = 0$ with $y(0) = y(1) = 0$ and $n = 0.23$ by finite difference method.							
	Two factories produced identical clocks. The product of the first factory consists							
3A.	of 10,00 clocks, of which 100 are defective. The second factory produces 20,00							
	clocks , of which 300 are defective. What is the probability that a particular defective clock is produced by the first factory 2 (Apply Baye's theorem)							
	If $f(x, y) = c^{\frac{2}{2}} = 0 \le x \le y \le c$							
	$ \begin{bmatrix} 11 & 1(x, y) - \\ a^2 & 0 \ge x \ge y \ge a \\ 0 & aba & b = a \end{bmatrix} $							
3B.	\bigcup 0, elsewhere . Find f (y / x) and f (x / y).							

Reg. No.



Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)



INSPIRED BY LIFE

3C.	Solve by Crank Nicolson's method, $\frac{\partial u}{\partial t} = \frac{1}{16} \frac{\partial^2 u}{\partial x^2}$, $0 < x < 1$, $t > 0$ $u(x, 0) = 0$, $u(0, t) = 0$, $u(1, t) = 100t$. Take $h = \frac{1}{4}$, compute u for one time step.	4marks
4A.	Solve the LPP graphically. Minimize $Z = 3x_1 + 2x_2$ subject to $5x_1 + x_2 \ge 10$, $x_1 + x_2 \ge 6$, $x_1 + 4x_2 \ge 12$, $x_1 \ge 0$, $x_2 \ge 0$	3marks
4B.	Suppose that X is a random variable for which E (X) = 10 and V(X) = 25. For what positive values of 'a' and 'b' does $Y = aX - b$ have expectation 0 and variance 1?	3marks
4C.	Solve $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = -81xy$. Given $h = \frac{1}{3}$, $0 < x < 1$, $0 < y < 1$, u(x, 1) = u(1, y) = 100, $u(x, 0) = u(0, y) = 0$	4marks
5A.	A coin is tossed 3 times.Let X denote 0 or 1 according as a tail or a head occurs on its first toss. Let Y denote the number of tails which occur. Determine (i) the joint distribution of X and Y (ii) marginal pdf of X and Y	3marks
5B.	In general when A and B play 12 games of chess. 6 are won by A, 4 are won by B and two end in a draw. They agree to play a tournament consisting of 3 games. Find the probability that (i) 2 games end in a draw (iii) A and B win alternatively	3marks
5C.	Find the mean and variance of Poisson distribution.	4marks