Reg. No.

MANIPAL INSTITUTE OF TECHNOLOGY MANIPAL (A constituent unit of MAHE, Manipal)

III SEMESTER B.TECH. Print and Media Technology END SEMESTER EXAMINATIONS, November 2018

SUBJECT: ENGINEERING MATHEMATICS III [MAT 2106] REVISED CREDIT SYSTEM (24/11/2018)

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

Answer **ALL** the questions. Missing data may be suitably assumed.

	Fit a parabola of the form $y = a + bx + cx^2$.													
1A.	x		20	40	60	80	1	00	120	140	160)		4
	у		5.5	9.1	14.9	22.	8 33	3.3	46	47.5	51.	3		
1B.	If $\vec{F} = (y^2 cosx + z^3)i + (2ysinx - 4)j + (3xz^2 + 2)k$, prove that \vec{F} is a conservative vector field and find the scalar potential.											is a	3	
1C.	Calculate quartile deviation and also coefficient of dispersion.													
	Class Interval			-5	5-10		10-15		15-20		20-25			3
	Frequency		6		10		12		10		8			
	Find tl	Find the regression equation of y on x for the following data.												
2A.	x	75	30	60	80	53	15	40) 38	4	18	35		4
	У	45	54	91	58	63	35	43	3 45	2	14	85		
2B.	Evaluate $\oiint_{S} A.n ds$ where $A = 6zi + (2x + y)j - xk$ and S is the surface bounded by the cylinder $x^{2} + z^{2} = 9, x = 0, y = 0, z = 0$ and $y = 8$.												3	

2C.	Derive D'Alembert's solution of the Wave equation.										3		
3A.	Find Fourier series expansion of $f(x)$ if $(x) = \begin{cases} -\pi; & -\pi < x < 0 \\ x; & 0 < x < \pi \end{cases}$, with period 2π . Hence find the sum of the series $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} \dots$.										4		
3B.	Solve by method of separation of variables $\frac{\partial u}{\partial x} = 2 \frac{\partial u}{\partial t} + u$, where $u(x, 0) = 6e^{-3x}$.											3	
	The foll	The following are the runs scored by 2 batsmen A and B in 10 innings.											
30	A	31	48	13	51	38	43	50	36	47	82		3
50.	В	51	5	12	83	37	112	42	18	79	20	_	
	Who is l	Who is better run scorer? Who is more consistent in scoring? Give reason.											
4A.	Solve by the method of indicated transformations: $\frac{\partial^2 u}{\partial x^2} - 4 \frac{\partial^2 u}{\partial x \partial y} + 3 \frac{\partial^2 u}{\partial y^2} = 0; v = x + y, z = 3x + y.$											4	
	An inco	An incomplete frequency distribution is given as follows											
	<i>C.I</i>	10 - 20	20	20-30		40	40 - 50		50-60 60-70 70			70 - 80	
4B.	f	f 12		30		-	65		- 25		5 18		3
	Also Giv	Also Given N=229, Median=46. Determine the missing frequencies.											
4C.	Verify Green's Theorem for $\oint_C x^2 y dx + y^3 dy$ and C is the closed curve of the region bounded by $y = x$ and $y = x^3$ from (0,0) to (1,1).											3	
5A.	Find Fourier sine series for $f(x) = x(\pi - x)$, $0 < x < \pi$.											4	
5B.	Find the angle between the surfaces $x^2 + y^2 + z^2 = 9$ and $z = x^2 + y^2 - 3$ at (1,2,3).											3	
5C.	Find Kurtosis for the following data;												
	Class I	nterval	(60-62 63-6		65	66-68		69-71		72-74		3
	Frequency 5 18 42 27 8												