UNITED COLLEGE OF ENGINEERING & RESEARCH		RESEARCH	DEPARTMENT OF APPLIED SCIENCES & HUMANITIES					
1.6	eciona		Semester:1	Section: A to M	Date: 4			_
l Sessional Exam Time: 2hrs			Subject: Maths	Paper code: KAS-103	Date: 16			
ALL INSTRUCTIONS AND QUESTIONS CAREFULLY								
(E)	10/234		N A (Attempt all q	uestions)	Mark	S		
				seations)		[6]	co	
	а	If $y=x^2e^{2x}$ determine $y_n(0)$.				1	2	1
	b	If $z = x^y$ find $\frac{\partial^2 z}{\partial x \partial y}$.				1	3	1
						1	3	-
	d	If $y = x^3 \log x$, show that $y_{4=\frac{6}{x}}$.			1	2	1	
	e	Define homogeneous function. Find degree of $f(x,y) = \frac{x^2y}{x+y}$.				1	3	1
	f	If $u = lx + my$, $v = mx - ly$, then find $\frac{\partial(x,y)}{\partial(u,v)}$					3	1
		SECTION B	(Attempt any thre	ee questions)				-
If $u = sec^{-1}\left(\frac{x^3 + y^3}{x + y}\right)$, prove that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = 2$ cot u . Also evaluate $x^2\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial x^2}$						[9]	3	1
$2xy\frac{\partial^2 u}{\partial y\partial x} + y^2\frac{\partial^2 u}{\partial y^2}.$ If $y = e^{asin^{-1}x}$, prove that $(1-x^2)y_{n+2} - (2n+1)xy_{n+1} - (n^2+a^2)y_n = 0$. Deduce that $\lim_{x\to 0}\frac{y_{n+2}}{y_n} = n^2+a^2$.							1	
-	f y = e	asin ⁻¹ x, prove that $(1-x^2)$	$y_{n+2} - (2n+1)x$	$y_{n+1} - (n^2 + a^2)y_n = 0.0$	Deduce that	3	2	1
1	f y = e lm _{x=0}	$\frac{a\sin^{-1}x}{y_n}, \text{ prove that}(1-x^2)$ $\frac{y_{n+2}}{y_n} = n^2 + a^2.$		NE				
1 1 1	$fy = e$ $\lim_{x \to 0}$ The tors $f(x) = e$ f	$\frac{y_{n+2}}{y_n} = n^2 + a^2$. sional rigidity of a length of a r increased by 2%, t increased	wire is obtained fr	om the formula $\frac{8\pi lL}{t^2r^4}$. If L is	decreased	3	2	
1 1 1	$fy = e$ $\lim_{x \to 0} f$ The tors $f(x) = f(x)$ $f(x) = f(x$	$\frac{a\sin^{-1}x}{y_n}$, prove that $(1-x^2)$ $\frac{y_{n+2}}{y_n}=n^2+a^2$.	wire is obtained fr sed by 1.5%, sho	om the formula $\frac{8\pi IL}{t^2r^4}$. If L is w that the value of N is di	decreased			4
1 1 1	$fy = e$ $\lim_{x \to 0} f$ The tors $f(x) = f(x)$ $f(x) = f(x$	$asin^{-1}x$, prove that $(1-x^2)$ $\frac{y_{n+2}}{y_n} = n^2 + a^2$. sional rigidity of a length of a r increased by 2%, t increased proximately. $f(r)$, where $r^2 = x^2 + y^2$ prospection C	wire is obtained fr sed by 1.5%, sho	from the formula $\frac{8\pi IL}{t^2r^4}$. If L is with the value of N is divided in $\frac{d}{dr} = f'(r) + \frac{1}{r}f'(r)$	decreased	3	3	1
1 1 1 1	$fy = e$ $\lim_{x \to 0} x = 0$ The tors $x = 0$ $13\% \text{ ap}$ $x = 0$	$\frac{y_{n+2}}{y_n} = n^2 + a^2$. sional rigidity of a length of a r increased by 2%, t increased by 2%, where $r^2 = x^2 + y^2$ pro-	wire is obtained from the sed by 1.5%, shown that $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2}$ (Attempt any three	from the formula $\frac{8\pi IL}{t^2r^4}$. If L is with the value of N is divided in $\frac{L}{r} = f'(r) + \frac{1}{r}f'(r)$ be questions)	decreased	3	3	
1 1 1 1	$f y = e$ $im_{x=0}$ The tors $im_{y=0}$ $im_{x=0}$ $im_{x=0}$ $im_{x=0}$ $im_{x=0}$ $im_{x=0}$ $im_{x=0}$ $im_{x=0}$ $im_{x=0}$	$a\sin^{-1}x$, prove that $(1-x^2)$ $\frac{y_{n+2}}{y_n} = n^2 + a^2$. Sional rigidity of a length of a r increased by 2%, t increasoproximately. $f(r)$, where $r^2 = x^2 + y^2$ provided $e^x \tan^{-1} y$ in powers of $(x^2 + 2y^2 - 4yz)$ are not independent.	wire is obtained from sed by 1.5%, shown that $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2}$. (Attempt any three inctions $u = y + \frac{\partial^2 u}{\partial y^2}$.	om the formula $\frac{8\pi iL}{t^2r^4}$. If L is w that the value of N is divided in $\frac{d}{dt} = f'(r) + \frac{1}{r}f'(r)$ be questions) The to the terms of degree 2. The equation $\frac{d}{dt} = \frac{1}{r} \frac{dt}{dt} = \frac$	decreased iminished by	3 [15	3	1
1 1 1	f y = e im _{x=0} The tors by 2%, 13% ap f u = f Expan Use Ji w = s them	$a\sin^{-1}x$, prove that $(1-x^2)$ $\frac{y_{n+2}}{y_n} = n^2 + a^2$. Sional rigidity of a length of a r increased by 2%, t increasoproximately. $f(r)$, where $r^2 = x^2 + y^2$ provided $e^x \tan^{-1} y$ in powers of $(x^2 + 2y^2 - 4yz)$ are not independent.	wire is obtained from sed by 1.5%, shown that $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2}$. (Attempt any three -2) and $(y-1)$ upon the pendent of one a	from the formula $\frac{8\pi IL}{t^2r^4}$. If L is with the value of N is divided by the following of the terms of degree 2. For example, $x = x + 2z^2$, where $x = x + 2z^2$ is $x = x + 2z^2$.	decreased iminished by between	3 (15	3	L

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