

Batch: 673 Roll No 16 1042 1063
Experiment / assignment / tutorial No.
Grade: AA/AB/BB/BC/CC/CD/DD

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	Arya Nair
	The second secon
Q1)	$4x^{2}y dy = 3x(3y^{2}+2) + (3y^{2}+2)^{3}$
	22
	Let Syztl = t
	by dy = dt
	Let $3y^2+2=t$ $6y dy = dt$ $y dy = dt$ $6$
	6
	$4x^2 dt = 3xt + t^3$
	6 dx
	$\frac{2x^2}{3} \frac{dt}{dx} = 3xt + t^3$
	3 dx
	Putting both sides 2 x2 t3
	10.000
	1 11 32 + 1 +3
	$\frac{1}{13} \frac{1}{10} = \frac{1}{2} $
	$ \frac{1}{t^{3}} \frac{dt}{dx} = \frac{3xt}{2x^{2}t^{3}} + \frac{t^{3}}{2x^{2}t^{3}} $ $ \frac{1}{t^{3}} \frac{dt}{dx} = \frac{3xt}{2x^{2}t^{3}} + \frac{t^{3}}{2x^{2}t^{3}} $
	$\frac{1}{t^3} \frac{dt}{dx} = \frac{9}{2xt^2} + \frac{3}{2x^2}$
	ON CAL DA
	This is Bernoulli Equation
	Let 1 = 2 {2
	$\frac{\ell^2}{-2} dt = d2$
	-2 at= d2
	ŧ ·
	$\frac{1}{1} dz = \frac{92}{12} + \frac{3}{12}$
	-2 dx 2x 2x2
	$\frac{1}{3}$ $\frac{1}$
	$dx x x^2$

$\frac{dz+4z3}{dx}$
dx x n2
this is LDE
General solution:-
$Z \cdot (1F) = \int (1F) \left(-\frac{3}{2^2}\right)$
7 (72)
(9dn
$IF = e^{\int \frac{9  dn}{2}} = e^{\int \frac{9  dn}{2}} = x$
$2x^9 = \int x^7(-3)$
$2x^9 = -3x^8 + C$
Putting real value of $Z$ $\frac{x^{9} - 3x^{8} + C}{4^{2}}$
$x^93x^8 + C$
£2 8
Putting value of t
$\frac{\chi^{9}}{(3\chi^{2}+2)^{2}} = \frac{-3\chi}{8} + C$
(342+2)2 8
Greneral Your Golution



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92)	$dr = rtant - t^2$
	de cost
	$\frac{1}{r^2} \frac{dr}{d\theta} = \frac{ten\theta}{r} = \frac{1}{r^2}$
	r2 da cost
	This is Bernoulli equation
	1 - t
	r
	-L dr = dt
	r
	11 - 11 - 1
	de de land - 1
	(3)#
	dt + ttant-1 dt (ost
	de conf
	7his 1. DE
	This 1. DE  Stantide = $e^{\log (\sec \theta)}$ = $\sec \theta$
	At IF= e = e = sect
	a do
	tx sect= ) 1 x sect df
	Cos A
	1 4 - ( 2 8 18
	$tsect = \int sec^2 \theta d\theta$ $tsect = tan \theta + C$
	Putting real value of t
	19 cong pen want of
	sect = tan # + c
	r
	Greneral Solution.
1/1/19/19/19	K.J. Somaiya College of Engineering, Vidyavihar (E), Mumbai - 400 077.

93)	$\frac{1}{x+0} \frac{e^{2x} - (1+2)^2}{x \log (1+2)}$
	2/09(1+2)
	p <sup>2</sup> = 1 + 2 + 2 <sup>2</sup> + 2 <sup>3</sup> , 2 <sup>4</sup>
	$e^{x} = 1 + x + x^{2} + x^{3} + x^{4} + \dots - 21$
	14
	$e^{2x} = 1 + 2x + (2x)^{2} + (2x)^{3} + (2x)^{4}$
	2: 3! 4.
	log (/tx) = x - x2 + x2 - x4 x5
	$\log(1/x) = x - x^2 + x^2 - x^4 + x^5 \dots$
	1 (1 6 2 6 3 ( 4 ) ( 1 4 )
	$\lim_{n\to 0} \frac{\left(1+2x+2n\right)^2+2n\right)^3+\left(2x\right)^4+\cdots-\left(1+x^6\right)^2}{2!}$
	$\frac{2(1-x^2+x^3+x^4+x^5+x^6+x^4)}{2(1-x^2+x^3+x^4+x^5+x^6+x^4)}$
	$\frac{\chi(\chi-\chi^2+\chi^3-\chi^4+\chi^5-\chi^6,)}{2}$
	ling [1+2x+2x2+4x3+2x4+] -1-2x-x2
	$\frac{\chi^{2}\left(1-\frac{1}{2}+\chi^{2}-\frac{1}{2}+\frac{1}{4}+\frac{1}{5}\right)}{2}$
	$\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{3}$ $\frac{1}{3}$ $\frac{1}{3}$ $\frac{1}{3}$ $\frac{1}{3}$ $\frac{1}{3}$ $\frac{1}{3}$ $\frac{1}{3}$
	$\frac{\chi^2\left(1-\frac{\chi}{2}+\frac{\chi^2}{2}-\frac{\chi^3}{4},\ldots\right)}{2}$

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lin	x2 (1+4x + 2x2 +)	
7-90	3 3	
1	22/1- x + x2 - x1	
	( 2 3 4 )	
		ALLE

$$\frac{1 + 4 + 2 + 2 + 2}{3} = \frac{1 - 2 + 2 + 2}{2} = \frac{1}{3}$$

$$\frac{1+\frac{4}{3}x^{0}+\frac{2}{3}x^{(0)^{2}}-\frac{(0)^{3}}{3}}{1-\frac{0}{2}x^{(0)^{2}}-\frac{(0)^{3}}{4}x^{(0)}}$$

Q4)	lim asinha +bsinx = 5 find a, b
- 1	$\chi^{-\gamma_0}$ $\chi^{\gamma}$
	Applying L'Hospital Rule
	la galantian
1	lim a cosh x + b cosx
	As denominator is zero numerator must also tend
	to zero. ath = 0
	Applying Lyllospital
	lim asinha-bsina
	7-70 6x
	Again denominator à zero so re apply 2º (tospita
	again
	$\lim_{x\to 0} a \cos hx - b \cos x = \frac{5}{3}$
	270 6 3
	Putting x=0
	a cosh(a) - 5x os (a) - 5
	6 3
	$a-b = \frac{5}{3}$
	0 1 - 15
	q - b = 10
	Salvia the dia estimate of
	Solving the two equations we get a= 5 5=-5  Hence
	ling Ssinhx - Ssinx = 5
	$\frac{1}{2}$